

APR 17 1922

Railway Age

FIRST HALF OF 1922—No. 15

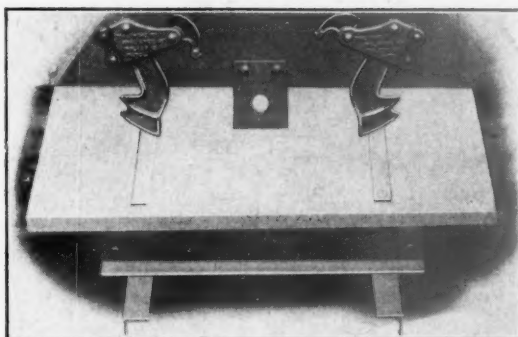
NEW YORK—APRIL 15, 1922—CHICAGO

SIXTY-SEVENTH YEAR

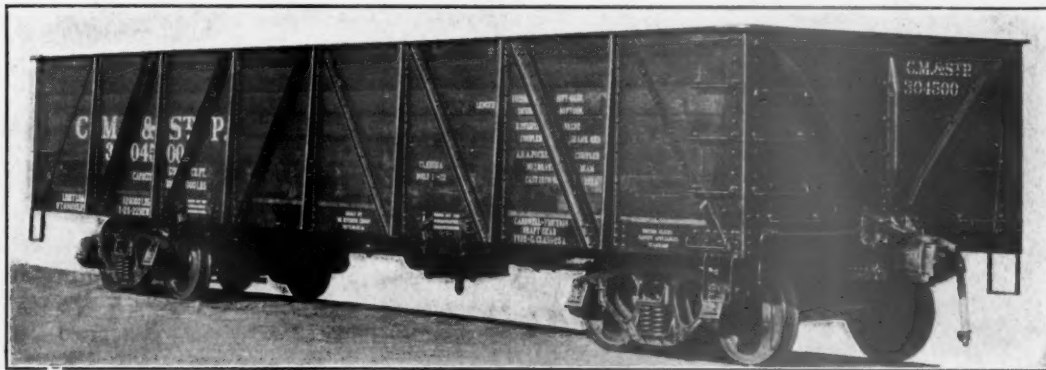
Published weekly by Simmons-Boardman Pub. Co., Woolworth Bldg., New York, N. Y. Subscription Price U. S., Canada and Mexico, \$6.00; foreign countries (excepting daily editions), \$8.00; single copies, 25c. Entered as second-class matter, January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

WINE DROP DOOR LOCKS

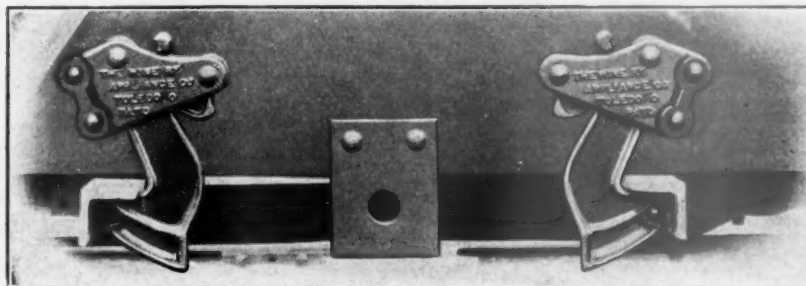
GENERAL LIBRARY
APR 15 1922
UNIV. OF MICH.



Applicable to all classes of Drop Door Gondola and Hopper Cars



Modern Cars are being equipped with this simple and inexpensive device



This device saved 800 pounds in the weight of this car

The Wine Railway Appliance Company
TOLEDO, OHIO

LINK YOUR POWERFUL UNITS WITH POWERFUL LINKS

ACCO ("Ajax" quality) Chain when used on powerful cranes and slung around heavy locomotives and cars will withstand the terrific stress, jerks and pulls of the wrecker. It is manufactured for that kind of service—brute strength is welded into every link.

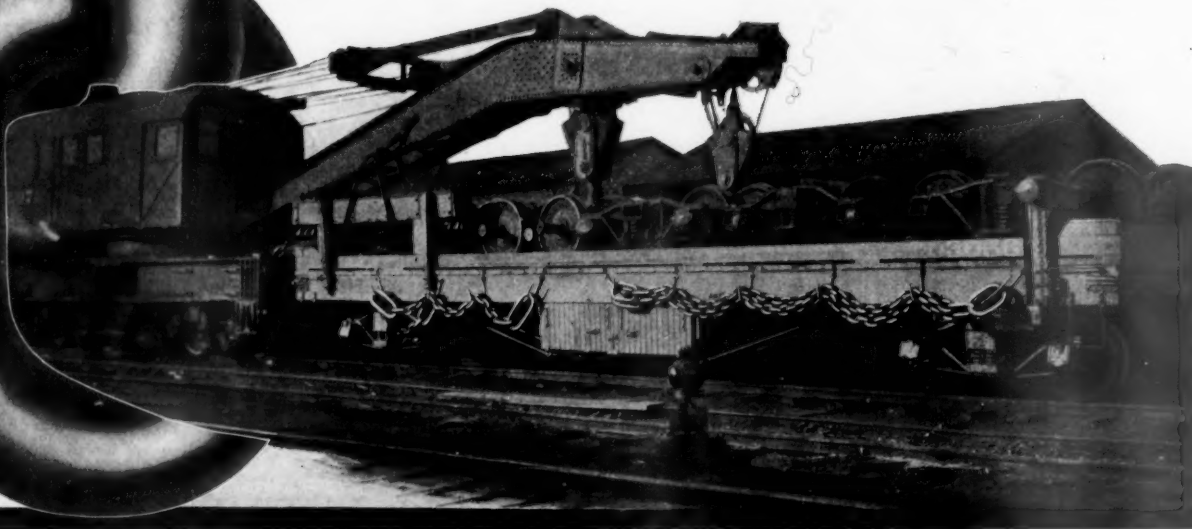
If you want quick, safe, and satisfactory operation, equip your wreck train throughout with

"ACCO" CHAIN

The extensive ACCO line includes chain for every railroad purpose.

American Chain Company
INCORPORATED
BRIDGEPORT, CONN.

District Sales Offices: Chicago Pittsburgh Boston
Philadelphia Portland, Ore. San Francisco New York



EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Annual Reports as a Medium of Publicity

IT WILL be generally admitted, we believe, that it is considered quite the proper thing for a railroad to devote some attention to telling the public something about its problems or its accomplishments. And yet there may be some question as to how generally this thesis is admitted. In spite of the large sums which are spent for publicity and—in the case of some roads—for advertising, it is still disconcerting, in fact, discouraging, to see how reticent some carriers can be. It would appear that the idea of publicity is regarded as correct theoretically but that in too many cases the practical applications receive a different kind of consideration.

Now publicity is neither simple, nor is it a science. We do not desire at this time to enter into a discussion of its manifold applications. We do desire, however, to point out that frequently much is lost that might be gained were it not for a mistaken attitude as regards the value of publicity, or possibly because of a failure to realize the possibilities of a situation. These thoughts are not new or original. They are, however, brought to mind by the recent advent of what can be aptly termed the annual report season.

A great deal of money is spent in the preparation, publication and distribution of annual reports. Some of them have an extremely wide distribution or, as it would be termed in the publishing field, a large and influential circulation.

It would be interesting to calculate the aggregate circulation of all the annual reports published in a single year, or to estimate the number of people interested in railroads who are reached by them. It would be a commonplace to say that the value of this circulation reaches high proportions. The question arises: Is this circulation properly used? The answer must be in the negative.

Some of the annual reports are truly formidable documents. They contain, in many cases, seemingly numberless pages of statistics of all kinds, a large proportion of which, we fear, are frequently not understandingly intelligible even to the officers of the roads which publish them. Of course, it is usually the case that these statistics for one reason or other must appear in some form or another, for there must be a readily available record for the use of those sufficiently driven, skilled, patient—or all three—to peruse them.

Nevertheless, it must be surprising if not also disappointing to a layman or a mere stockholder to see how much mate-

rial can appear in a report statistically and yet how little can be gleaned from this vast maze of statistics as to the actual operations of the railroad in which he is interested, or as to the railroad problem as a whole. And who is more entitled to have these details than the stockholder? Who is it more useful to inform than he who is already in a receptive frame of mind? The situation as it exists today is not fair to the stockholder. In view of the expense incurred in getting out the annual reports, it is still less fair to the railroad company.

There is a remedy for this, and an extremely simple one. It is merely to expand on the president's remarks to his stockholders—to give in addition to the income account, balance sheet, statement of revenues and expenses and all the other necessary figures, something more than a mere perfunctory statement explaining these figures. Why not discuss in an interesting manner such things as the conditions of the year on the railroads in general and on the railroad issuing the annual report, in particular; the amount of business, why it increased or decreased, the matter of costs, relationships with labor, competition with the motor truck, problems of increasing taxation, new engineering projects proposed or under way and the various other details in which the public is primarily interested? There is a story to tell in the case of every railroad. Why not tell it?

This idea contains nothing particularly new or particularly startling, in proof of which we should suggest the perusal of the annual reports of such lines as the Pennsylvania, the Boston & Maine, the Southern and others of a small minority of railroads which have realized the value of these important documents. These reports all constitute interesting and informative reading and they all follow the ideas herein suggested. The Pennsylvania report, incidentally, adopts the valuable idea of pointing out the net after rentals and return on the investment, a good idea truly in view of the importance given these figures in section 15-a of the Transportation Act. The Southern issues its preliminary remarks in a small booklet distinct from the annual report itself, which booklet is sufficiently interesting to assure one that it must be of great value for purposes of telling the railroad's story. In the case of the Lackawanna, the most authoritative information concerning the contemplated electrification project at Scranton, a matter of very lively interest,

appears in the 1920 annual report with a resulting increase in the interest and value of the report.

Roads which are adopting this policy in connection with their annual reports are utilizing the opportunity presented. They give the stockholder details characterized by their value and interest alike, and sufficiently well gotten up and worded so that the person who receives the report is not unduly wearied in reading them understandingly.

Publicity schemes usually cost large sums of money and require much time and thought. Annual reports are expensive and elaborate—and also necessary. Why not use them to best advantage and make them worth while—without additional expense—by causing them to play their part in the publicity scheme?

The railroads that are already taking the very simple steps to utilize their annual reports in the manner suggested are "selling" their railroads to their own stockholders.

It has been stated over and over again, in addresses, newspapers, magazines, and even books, that the railways are seriously behind as to adequate facilities, terminal and otherwise. The public, in its way, realizes this. Yet the public is fickle and that characteristic must be recognized as we have stated in previous editorials. The engineer can play no small part in helping to educate the public, for it is the work his department is doing or is intending to do, that will remedy much of the inadequateness of facilities. And the describing of this work, whether under way or projected, will do much to prove to the public that the railways are really endeavoring to overcome the deficiencies. Too often the details, or for that matter even the general outline, of the work being undertaken are not released to the newspaper and technical magazines until the work is so far along—even completed—that the opportunity of producing a real effect on the public has passed. It is no longer news—it has seeped into the public's mind by degrees and so slowly that the people fail to recognize that something is being done for their ultimate benefit. Stop hiding your light under a bushel! Some roads have and the rest should do so!

Each year sees a large number of small construction tasks, such as the building of tool sheds, section houses, box culverts

Every Day Economy Possibilities

and other miscellaneous work, whose performance is usually considered as a routine matter. Such work is commonly carried out with the regular forces and the cost, while more or less simple to compute, varies with the materials employed, the labor and its relative efficiency. There are possibilities for making savings in this work which, while not large in any particular instance, may amount to a substantial and worthwhile sum when taken as a whole. A method not exactly new, yet certainly not common, is the assignment of this work to capable, regular forces with the understanding that, in addition to their wages, they will be given, for instance, one-half of whatever they save in the cost of the work. This estimated cost can be figured quite accurately, the figures used being based on the amount of work ordinarily performed in a given territory by the labor assigned to it. Any saving in the cost is clear gain for the railroad, as it is so many dollars actually saved; in addition indirect benefits may be derived through the data so obtained and through the training of the men to plan their work.

Occasionally critics of the railroads refer to the provisions of the Transportation Act—which for the two years ended

A "Fair Return" for Railroads and for Ships

on February 29 directed the Interstate Commerce Commission to try so to adjust rates as to give the railroads of the United States as a whole a return of $5\frac{1}{2}$ to 6 per cent on their value—as constituting a subsidy. In this connection it may be noted that the administration plan for giving a real subsidy to the operators of merchant ships contemplates 10 per cent on the invested capital as a fair return. Robert H. Montgomery, the accounting expert who testified before the Congressional committees as to this provision of the ship subsidy bill, explained as the reason for proposing a 10 per cent return for shipping that "if 6 per cent is considered a reasonable return on capital invested in railroads and other public utilities which are monopolistic in character and whose earnings are subject to far less fluctuation, a minimum of 10 per cent would appear to be a fair return on capital employed in the hazardous business of overseas shipping." Recent history shows, however, that even railroading is subject to rather violent fluctuations, since the traffic of 1921 was approximately one-fourth less than that of 1920. The ship subsidy bill, it is true, does not in any way provide for a guaranty of 10 per cent, or any other per cent, any more than the railroad law provides for a guaranty, as indicated by the fact that during the period this so-called guaranty provision was in effect the railroad net return scarcely exceeded three per cent. The shipping bill provides that companies having a net operating income in excess of 10 per cent shall return to the government one-half of such excess, whereas the Transportation Act provides that any railroad shall return one-half of any excess over 6 per cent. But there is also another difference. The shipping bill provides for the "recapture" of one-half of the excess only up to the amount of the direct subsidy that may have been received, while a railroad earning more than 6 per cent is required to give up one-half of the excess although it has received no subsidy; it has merely been allowed to charge rates which were sufficient to enable railroads as a whole to earn three per cent.

Every catastrophe brings to light certain shortcomings in practice. The recent destruction of a large part of the con-

The Protection of Records

tents of the Burlington general office building in Chicago furnishes another illustration of this fact. This fire occurred in a building of the most modern construction, as is indicated by the fact that it was given the lowest insurance rate of any office building in the city. In spite of the terrific attack to which it was subjected, the building did as well as could reasonably be expected of it. The fire did not extend from one floor to another but each floor suffered an individual conflagration communicated from the exterior. Yet the contents of seven floors were entirely consumed and large quantities of records were destroyed, many of which can never be replaced. This fire demonstrated the inherent weakness of ordinary window construction. While past experience had not shown the necessity of wire-glass window construction on the sides of buildings facing streets, this was the vulnerable point in the Burlington building. There is rather conclusive evidence that wire-glass windows would not have withstood the flames, but it is reasonable to expect that they might have delayed the progress of the fire to such an extent that the fire department would have had a chance to have fought it to better advantage. The fire also demonstrated the importance of reducing the combustible contents of an office building to the minimum, for while metal furniture would not have withstood the flames, it would not have added fuel to the con-

flagration. However, the lesson of this catastrophe is that no building designed for efficient office use can be secure against fire hazard from outside sources. When a building of as nearly fireproof construction as the Burlington building was can be gutted by a fire, the danger to the average railway office building can be realized. In addition to reducing the fire hazard in offices and record rooms to the minimum, the railways also face the necessity of taking such steps as may be reasonably practicable to reduce the possibility of loss if such a fire should occur. This involves consideration of the advisability of duplicating important records for storage at widely separated locations, the installation of ample fireproof vaults in which records in current use may be stored over night and similar measures. The time for action is now while the danger is fresh in mind.

The International Railway Congress will be held at Rome, Italy, from April 18 to 30. The American delegates, of

The Railway Age at the Rome Congress

whom there are a goodly number and whose names have appeared previously in these pages, are already in Europe or on the way there. The *Railway Age* will be represented by its editor, Samuel O. Dunn, who sailed on April 4. Mr. Dunn's observations of the congress will be published in the *Railway Age*. After the congress, he will spend several weeks traveling in Europe. He expects to record his impressions for *Railway Age* readers in the form of weekly letters.

The *Railway Age* has received information, which will doubtless be of interest to many of its readers, that Clifford

Thorne Wants to Be Senator

Thorne, now of the Chicago law firm of Thorne & Jackson, who as attorney for various organizations of shippers and for a time as chairman of the Iowa railroad commission has for several years been one of the most prominent if not one of the most successful of railroad baiters, is about to announce a campaign for the seat in the United States Senate which will become vacant upon the expiration of the term for which W. S. Kenyon, recently appointed a federal judge, was elected. If Mr. Thorne should succeed at the polls the state of Iowa, which has always been especially interested in railroad affairs, would be represented in the Senate by two widely differing varieties of statesmanship in relation to transportation questions. Senator Cummins, now chairman of the Senate Committee on Interstate Commerce, stands for the constructive policy represented by the Transportation Act, which seeks to make the railroads an adequate and effective instrument of commerce. For a good many years Mr. Thorne has been collecting fees for his efforts to have the laws relating to railroads made and enforced in the interests of his clients. These efforts and those of others in a similar direction have been among the causes that finally made it necessary to enact a law which, in the interest of the public as a whole, would contain a recognition of the rights of railroads as well as of shippers. Whether this has led to a situation such that Mr. Thorne has decided it is time for him to seek a broader field of activity, or whether he considers that his influence on railroad laws may be more potentially exercised from within the lawmaking body than from without, we are not informed, but we believe that Mr. Thorne's kind of activity was somewhat more effective while he was occupying a public office and speaking in the name of the public as a representative of the Iowa and other state commissions than it has been when exerted in behalf of private interests. At any rate it takes all kinds of people to make a world and Mr. Thorne doubtless realizes that the statement also applies to the electorate of Iowa.

Best Accident Record in History

THE RAILWAYS of the United States in the year 1921 made the best record for safety of operation that they have ever made in the 34 years since accident statistics have been compiled by the Interstate Commerce Commission. Undoubtedly the record was the best ever made as it is not probable that any better record was made before the statistics began to be compiled.

The statistics of accidents in 1921 the Commission has just made public are not quite complete, but they are near enough so to indicate beyond any question what the complete statistics will show. The statistics for 1920 showed that in proportion to the number of persons employed by the railroads and the amount of traffic handled, the number of persons of all classes killed in that year was the smallest in history. Most of the statistics for 1921 just made public by the commission are much better than those for 1920. This seems fully to warrant the conclusion that when they are available the complete statistics for 1921 will be better than the complete statistics for 1920.

Only the figures regarding persons killed will be given here, as owing to the changes in the ways of reporting them, those regarding persons injured are always of doubtful significance.

The total number of employees on duty killed in train or train service accidents in 1921 was 1,096. This was a reduction of 1,011, or 48 per cent, as compared with 1920. It is the smallest number of employees on duty ever killed in any year for which statistics are available. The number of passengers killed was 205. This is a reduction of 24, or 10½ per cent, as compared with 1920. It is the smallest number of passengers ever killed in any year for which statistics are available except 1895, 1896 and 1915. The total number of employees on duty and passengers killed in train and train service accidents was 1,301 as compared with 2,336 in 1920—a reduction of 44 per cent, and the smallest ever reported. The total number of "non-trespassers"—that is employees, passengers and all other persons having a right to be on railway property—killed was 3,106, as compared with 4,329 in 1920, a reduction of over 28 per cent.

The foregoing statistics do not include fatalities resulting from "industrial and other non-train" accidents—that is accidents occurring in shops and other places which were not due to the operation of trains. The number of persons killed in such accidents in 1920 was 463, and in 1921, 409, a reduction of 12 per cent.

The only class of persons the fatal accidents to which showed an increase was trespassers. The number of these persons killed in 1920 was 2,166, while in 1921 it was 2,481, an increase of 14½ per cent.

The Commission's statistics of accidents for the last 15 years reflect an increase in the safety of railway operation in the United States which probably has not been surpassed, and may not have been equalled, in any other industry in this country, or on the railways of any other country.

The fatalities on railroads reached their maximum in 1907. In that year the total persons of all classes killed was 11,839. Of these, 4,534 were employees and 610 were passengers. The number of fatal accidents has fluctuated from year to year since then, but has shown a generally declining tendency. The traffic of 1921 represented a very large decline from that of 1920, but the decline in fatalities to employees and passengers was relatively much greater. In 1921 the railroads handled about one-third more passenger business and about one-half more freight business than in 1907, but the number of employees and passengers killed was almost exactly 66 per cent less than in 1907.

There has not been a corresponding reduction in the number of trespassers and other classes of persons killed. Auto-

mobile accidents have seriously interfered with efforts to reduce the number of people killed at highway crossings. Nevertheless, when the complete figures for 1921 are available they will show that the total number of persons of all classes killed was only about 6,000. It was only about one-half the number killed in 1907, and probably was less than the number killed in any year since 1889.

When it is considered that the total number of persons killed in 1921 was about the same as in 1889, while since then the number of employees has increased about 140 per cent, the passenger traffic handled about 225 per cent and the freight business handled about 400 per cent, some idea of the increase in the safety of operation which has occurred within the last 30 years, and especially during the last 15 years can be formed.

The great increase in safety of operation has been largely due to improvements in the railway plant. It has been very much more largely due to the education of employees to the need of observing the rule of "safety first" in their work, for the great majority of accidents always has been due to man failures rather than to plant failures.

Make the Valuation

Reports Easier to Use

THE VALUE of any work may be measured by the use to which it may be put. Based on this premise the work of the federal valuation forces is falling far short of its possibilities and the Division is not fully discharging its obligation to the public. This work has now been in progress for nearly ten years and has cost the carriers and the government over \$80,000,000.

Tentative reports have been issued on nearly 200 properties and this number is being increased almost daily. Copies of these reports are being sent to the railways concerned, to the governors and the public service commissions of the states in which the properties are located, and to the attorney general of the United States. These, however, constitute only a small portion of those interested; the investors in the securities of the railways have a direct interest, as do the shippers and the public at large. In view of these vast expenditures of time and money it is important that the reports be presented in a manner which will enable these various interests to place the same interpretations upon the information and make them of the maximum value to all interested parties. This is not now being done. Undertaken originally as a means of protecting the public from the evils of over-capitalization then feared, the valuation work is now seen to afford protection to the investor.

The reports as now issued contain a vast mass of information concerning the properties which is bewildering to the average railway man, investor, or public officer, and is understandable only to the expert; moreover, because of their complicated make-up they may be misused to the detriment of public interest. Important and necessary as this information is; it would seem highly desirable for the commission which has prepared the report and collected the information incorporated in it, to summarize this information in a brief introductory statement in which there would appear those figures in which the vast majority of the people are interested. These include the commission's findings of value, including the property owned and used for transportation purposes, the land and buildings owned but not used for transportation, and other investments, in contrast with the capitalization, and the carrier's and the commission's book record of investment in road and equipment. Further than this, many are interested in the cost of reproduction and the cost of reproduction less depreciation of the property owned and used, and of that owned but not used for transportation purposes.

By summarizing this and other basic data which would involve little additional work, the commission would protect its report from mis-use and mis-interpretation and would complete the service to the public for which the Division of Valuation was created. The commission owes it to itself, as well as the public, to complete its report in this way to protect itself against the mis-use of its information and to enable the public regulatory bodies, the railways and investors to avoid all possibility of confusion as to results. The commission will render a great service to the railways and to those interested in them by presenting such a summary in order that "he who runs may read."

Railroad Terminals Come High

A MAN who enters a manufacturing venture is confronted with an exceedingly difficult problem in the design of his plant. Obviously he must plan for the future, but his efforts at a solution are hampered by the necessity of making some exceedingly rough approximations concerning future requirements. He can only guess at the growth in the volume of his business and the probable character of the product most in demand, and it is, of course, impossible for him to forecast improvements in manufacturing processes which may render a large part of his plant obsolete. He must also guard against excessive capital expenditures. As a result, his provisions for the future are necessarily limited, and as years go by he is compelled to discard portions or even entire units of his plant to make way for new facilities adapted to new requirements.

So it has been with railroad terminals. Changes in conditions, too well understood to require mention here, are constantly compelling the roads to raze existing terminals and replace them with new ones designed to meet the requirements of the present with further allowance for the future. In general, such replacements cannot be considered as added facilities, but merely as enlargements of the existing plants. Yet in spite of this, the expenditures which are entailed in such replacements assume enormous proportions. Thus, in the city of Chicago, the railroads are committed to an expenditure of 150 million dollars for track elevation. This enormous outlay, two-thirds of which has already been made, will add little to the facilities for the conduct of railway transportation.

The renewal of passenger and freight terminals in that city also involves an enormous expenditure. That of the North Western, completed within the last ten years, totaled more than 20 million dollars. The work now in progress for passenger and freight facilities in what is known as the Union Station group will cost over 65 million, while the improvements to which the Illinois Central is committed are estimated to cost 85 million. The remaining group of railroads, which includes those using the Dearborn, La Salle and Grand Central stations, are now using passenger and freight facilities which are admittedly inadequate and various plans completed or now under consideration indicate that not less than 50 million dollars is necessary to effect the replacements of existing terminals to meet the needs of the immediate future.

The aggregate of all these expenditures reaches a total approaching a half billion dollars, and represents an outlay that is not designed to open new markets for transportation, but provides simply for the renewal of terminals which, while required primarily for increases in traffic, are nevertheless an enormous additional charge against transportation over a railway mileage which has not measurably increased. This unquestionably imposes one of the greatest burdens on our national transportation system and occupies an important place in what is termed our "transportation problem."

Railroads Are Buying!

THE RAILWAYS are preparing for the country's expected prosperity and the resulting increased business. They are ordering freight and passenger cars in unusual volume and the announcements of authorizations for the expenditure of millions for additions and improvements by the various roads are tripping so closely upon one another's heels that it is becoming difficult to realize how much there is to be done.

The *Railway Age*, in its issues in January, reported the placing of orders for 7,960 freight cars; in February, for 14,771 and in March, for 6,550, a total for the three months of 29,281. In the two issues which have been issued so far in April, excepting, that is, the present issue, orders for 5,010 cars were reported, or a total to date of 34,291. In the first three months, as noted, the total was 29,281, which compares with total domestic orders in all 12 months of 1921 of 23,346. A comparison with 1921 is not of great value because 1921 was characterized as being an exceedingly poor year. But, nevertheless, 1921 had to be tolerated and that we are now out of it is not the least of the things we can be thankful for. The year 1916 may perhaps be a better year to choose for purposes of comparison. In the first three months of 1916 the freight car orders totaled 38,169.

THE CAR AND LOCOMOTIVE ORDERS OF 1922

	Freight cars	Passenger cars	Locomotives
January	7,960	235	5
February	14,771	160	8
March	6,550	25	77
Three months	29,281	420	90
April, first two weeks.....	5,010	423	86
Total	34,291	843	176

It is too early in the week at the time this is written to estimate how many cars will be reported as ordered before the week is ended. The number will be considerable for the placing of orders by the New York Central for 16,000 cars, and of large orders by other companies, guarantees that the present week will see the placing of more business than has been the case for any week in many months.

A feature of the 1922 freight car business has been the size of the orders as evidenced by the New York Central's 16,000, the Burlington's 7,300; the St. Paul's 4,000; the Norfolk & Western's 4,000; the Union Pacific's 4,500; the Pacific Fruit Express' 3,300, etc.

The passenger car business has come into its own after a long-drawn-out period of lethargy. Passenger car orders were omitted from the scheme of things during federal control. During all 1921, the passenger car orders totaled only 246. In the first three months of 1922, the orders totaled 420; in the *Railway Age* of April 1, there were reported 50, and in that of April 8—last week's issue—there were reported 373, a total thus far this year, therefore, of 843. The figure for the first three months of 1922—420—compares with that of the 537 for the first three months of 1916. But it is worth remembering that in one week of 1922, the issue of January 21, more passenger car orders were reported than the figure for Class I roads in all of 1921, or that in last week's issue the Pennsylvania's order for 250 cars again exceeded the 1921 figure.

The buying of locomotives has not yet reached the same proportion as in the case of cars. A buying movement has started, however, and should soon be showing results.

Last year was not a good year. It was, on the contrary, an exceedingly poor one. A comparison between the record of an exceedingly good period such as we are now in, with the poor conditions of 1921, therefore, has some interesting results. There are several railway supply concerns that report having taken more business in one month—in some cases, in one week—than in all 12 months or all 52 weeks of

1921. A marked change indeed, and, no doubt, all the more appreciated because of the sharpness of the contrast.

"Philadelphia & Reading's Improvements to Cost \$15,000,000," "Pennsylvania to Spend \$8,000,000 in Pittsburgh District," "Union Pacific Plans \$29,000,000 Outlay." These are typical of the headlines which one can see with increasing frequency in the daily papers. They indicate optimism—practical optimism, that is—and prosperity. The railways went through a very trying year in 1921. They earned for the year but 3.3 per cent on their property investment. The amount of traffic they handled was comparatively small—so much below 1920 as to be hardly comparable. Although the 1921 net was not as great as the Transportation Act requires, it was greatly in excess of the 1920 figure. The reason for the increased net with the greatly decreased traffic was the extremely severe cuts in expenses. Except in the matter of wages—still under consideration—the railways succeeded in getting things back on a rock bottom basis. They made savings in maintenance—less, insofar as concerns the final result, in way and structures than in equipment.

As concerns equipment, the railways now have a higher percentage of bad order cars and unserviceable locomotives than is advisable. This means that there is still a large amount of repair work to be done although it is also to be presumed that the proportion of bad orders will be reduced in due time through retirements of worn out or obsolete equipment. Track is better now than it was in 1920 in spite of the 25.9 per cent reduction in expenses of maintenance of way in 1921. It is by no means restored to pre-war standards. Further than that, there is to be overcome the suspension which took place in 1919, 1920 and 1921 in improvement work. The railways, in short, have a big program of catching up ahead of them. The placing of these large orders for freight and passenger cars and the authorizations of expenditures for other kinds of improvements show a realization of that fact. They also show a will to accomplish that which is necessary to supply a pre-war standard of transportation service.

The most practical feature of the situation, however, is the manner in which preparations are being made for the coming of prosperity. This program would not now be under way if the railroads were not convinced that business is about to pick up and to pick up in considerable extent. But, further than that, the railways are, in fact, taking the lead in the whole situation and by so doing are themselves starting the ball rolling. By and large, things look good for 1922. It seems safe to feel optimistic and enthusiastically optimistic at that.

New Books

Modern Tunneling, by Brunton & Davis. Second edition with new chapters on railroad tunneling, by J. Vipond Davies. 6½ in. by 9 in. 612 pages. Illustrated. Bound in cloth. Published by John Wiley & Sons, New York.

As stated above this is a revision and enlargement of the first edition published in 1914, the revision consisting in the addition of 200 pages devoted to railroad or larger bore tunnels. The earlier edition was confined primarily to water and mining tunnels of smaller section than those used in railway work. Apparently, the first 400 pages have not been revised in the new edition since all data and references antedate 1914, the date of previous publication. Consequently, references to the more recent tunnel projects do not cover their completion subsequent to that time. This seems rather unfortunate in the case of the table of noted railroad tunnels on page 32 since it omits reference to the Rogers Pass or Connaught tunnel, the longest railway bore in

America. The arrangement of the text very properly is topical, taking up the various factors entering into tunnel work in separate chapters, including such subjects as machinery, ventilation, drilling, timbering, blasting, etc. Another noteworthy feature of the book is the large amount of space given to bibliography. This amounts to 60 pages in the older portion and is supplemented in the newer part by 9 pages. The 200 pages on railroad tunneling are subdivided into chapters dealing with the general subject and construction and are followed by chapters treating of the building of tunnels through different classes of materials, beginning with hard rock, following with loose rock and softer materials and terminating with a rather extended treatment of subaqueous tunnels. In this connection it is to be noted that outside of the Mount Royal and Rogers Pass tunnels, the principal references to particular projects relate to tunnels built in the vicinity of New York City.

The Transition Spiral. By Arthur Lovat Higgins, assistant lecturer in engineering in the Victoria University of Manchester, England. 5 in. by 7½ in., 110 pages, illustrated. Bound in cloth. Printed in Great Britain. D. Van Nostrand Company, New York.

This handbook deals with the development of a transition spiral which will be of easy and practical application in the field and yet afford an effective compromise between the elements necessary for that result and those for correct mathematical truths. The curve developed is the clothoid which, according to the author, does not necessitate the use of tables, is virtually interchangeable with the cubic parabola and lends itself readily to the three characteristic modes utilized in American spiraling practice; i. e., a constant chord length, the number of chords constant, and constant deflection angles.

Earthwork in Railway Engineering. By John W. F. Gardner. 6 in. by 9 in., 152 pages, illustrated. Bound in cloth. Printed in England. D. Van Nostrand Company, New York.

The apparent intent of the author, an Englishman with experience on English railways, has been the presentation of the underlying principles controlling earthwork in a practical and easily understandable manner. In many respects, he has succeeded admirably although the book, so far as its application to American uses is concerned, suffers somewhat from the handicap of being largely descriptive of English practices. Much of the chapter dealing with the execution of earthwork, as well as the chapters on drainage and, in particular, slips in earthwork, are quite applicable to any practice and are interesting and instructive for students of railway construction.

Design of Steel Mill Buildings. By Milo S. Ketchum, director of the department and professor of civil engineering, University of Pennsylvania. 6½ in. by 9 in., 632 pages, 410 illustrations. Published by the McGraw-Hill Book Company, New York.

This is the fourth edition of this book on the design of steel mill buildings; it has been rewritten and enlarged. In the original edition, it was intended to provide a short course in the calculation of stresses in framed structures and to give a brief discussion of mill building construction, with the underlying idea of presenting methods, data, and details on design and the making of estimates not ordinarily found available. The fourth edition, following along these lines, has been enlarged to include a discussion of the calculation of the stresses in statically indeterminate trusses and frames, several problems in framed structures, detailed designs of a crane girder, a roof truss and a steel frame mill building. The text has been divided into three parts and an appendix, the latter covering specifications for steel frame buildings.

Letters to the Editor

[The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated.]

Standardization of Automatic Connectors

NEW YORK

TO THE EDITOR:

I have read with much interest the editorial on The Future of the Automatic Hose Connector which appeared in the *Railway Age* of February 11. I note in the article the following paragraph: "There will be no extensive application of connectors to freight equipment until through some agency all but one type of gasket face and one type of gathering device has been eliminated. But who ought to do the eliminating?" That is now the heart of the connector question. "Who ought to do the eliminating?" Some contend, and I understand your article to contend, that the connector manufacturers should do it, while others claim it is a matter for the railways. It seems to me that the latter is the correct view.

For the manufacturers to undertake to determine the standard connector would be much like a lawyer acting as advocate and judge in his own case. The railways are the customers for the connector. Is it not their wish, expressed through a proper committee, which should be the deciding factor in arriving at a standard? Can it be regarded as likely that any association of connector manufacturers could persuade all the railways of the United States and Canada operating approximately three million cars, to use a single connector type merely because they recommend it? Granting that such a thing is possible, which I do not believe, would it be the logical course from the viewpoint of the railways? The connector manufacturers are not immune from the commercial instinct any more than any one else. As between a good device, which they cannot control by patents, and a good device which they can control, it would be but natural that they should recommend the latter. The railways, on the other hand, would prefer to select the device least protected by patents.

Thus the standardization of a connector is confronted, at the outset, with a conflict of interests, the consumer desiring to adopt, as far as possible, an unpatented device and the producer desiring to protect his shareholders, and his own heavy investment in time and money, by getting adopted something which his patents control. To my knowledge, one of the two connector companies now most active has spent several years of hard effort, and probably a half million dollars bringing its device to a state of efficiency, while the other company has spent more than a million dollars and fourteen years of equally hard effort developing the connector it offers. Naturally they will labor earnestly to secure some benefit from a thing obtained at so dear a price.

This is the chief difficulty in the way of realizing the good which could come from the acceptance of your suggestion that the connector manufacturers voluntarily "get together." An endeavor to accomplish this has been repeatedly made during the past ten years, and in each instance it has failed because of the inability of the connector companies to agree upon the consideration to be awarded the different companies for their patent rights. Each concern believes in the merit of its device and regards it as the one which the railroads should adopt. It is to no purpose to

disagree with them. Until the railroads have indicated what they want in a connector, these companies are about as well off in the argument as those who may oppose their convictions. As matters stand, it is simply a matter of difference of opinion. Until the railways have decided on a standard connector, the companies do not know where their respective devices stand and cannot negotiate intelligently.

A few months ago, for instance, when this matter of getting together was up among the connector people, one concern having but one connector and only eight patents (as far as I know) to contribute, demanded 60 per cent of the benefits of the entire combination. How is it possible to make any headway toward "getting together" under such circumstances? Except for the extent of their demand, the attitude of this company is typical. It has a device which is being favorably received, its officers are honest, conscientious men who really believe their device superior to all others. Until some disinterested, authoritative committee has confirmed, or rejected, their conviction, the likelihood of "getting together" with them is remote.

You may say leave them out, but that would not cure the difficulty. Where and by whom would the line be drawn on the leaving-out process? Besides, this concern may be entirely justified in its conviction. I do not, of course, think it is, but after all that is only my opinion. It may be that this company has a device which the railways should use, in which case it is entitled to the larger share. But who is to determine whether it has or has not such a device? Can it be expected that a committee made up of engineers, representing the different competitive connector manufacturers (which would be the expected of course if the connector manufacturers are to get together, and themselves decide upon a connector to be offered for standardization), would render a decision acceptable to this company? Each member of such a committee would be prejudiced by his own ideas of connector design, and it is extremely doubtful that his vote would fail to reflect this prejudice. Is not the question of standardization really one for the railroads? It is they who must be satisfied as to design.

Even if it were possible for the connector manufacturers to get together at this time, what good would it accomplish? I cannot imagine the railways adopting a connector merely because it is presented to them by the various connector manufacturers as a body. The roads would, and with good cause, insist upon thorough demonstration. Why not then have this demonstration now? Let a committee representing the railways select the various connector designs which it regards worthy of trial and put them through a series of conclusive elimination tests, select therefrom the connector most desirable for standardization and then compel the connector manufacturers to get together on patents, with a penalty for failure of refusal by the roads to standardize any connector. Such a course would bring to light the connector the roads are willing to use, and would make known to the connector manufacturers what they were to get together on. Under such circumstances it can scarcely be doubted that they would get together. To refuse would be to stand in their own light and postpone the general use of any connector.

Until something of this kind is done, it seems to me that any attempt to get together on the part of the connector manufacturers on a basis involving the giving up of patent rights, which I understand to be the basis your article suggests, would be to negotiate in the dark. Each concern would hesitate to give up any of its rights in return for a share in the rights of something which they do not know the railways want, and which they conscientiously believe less meritorious than their own device. Could you blame them for this? None of us like to "buy a pig in a poke," and that would be the nature of such a trade in the absence of some indication by the railways as to exactly what they want in the standard connector.

Considerable impetus would undoubtedly be given the subject if the connector manufacturers would come together in a friendly association, not involving any sacrifice of patent rights, but compelling each joining company to work in harmony with its member companies for the adoption of a connector by the railways (leaving it to the railways to determine what design they want), and to accept the railways' fair recommendation as to patent rights and price at which the connector should sell. I have long advocated such an association and would be glad to do anything I can to bring it about.

JOSEPH ROBINSON.

The Boiler Compound

CHICAGO.

TO THE EDITOR:

I desire to take exception to a number of statements which appeared in "a criticism" of the article entitled *The Interior Treatment of Boiler Waters* (November 12, 1921, page 935), which criticism appeared in the *Railway Age* of December 24, 1921, page 1241. It is being admitted more and more generally that there is more in the field of chemistry that relates to water treatment than lime and soda ash. In a paper presented before the Western Railway Club of Chicago two years ago on the treatment of water for locomotive use, the consulting chemist of the Union Pacific system said:

"It is a mistake to believe that treatment with boiler compound is identical with the process of water softening. If anyone has the idea that the manufacture of boiler compounds is a sort of hit-or-miss proposition, I would ask you to correct this impression. There is room for more variation in the composition of boiler compound than there is in outside treatment. Because fraud may have been detected in attempts to sell boiler compounds that have no value, I do not believe in condemning the use of honestly made compounds."

The United States Geological Survey has, for many years, published the following statement in its water supply papers, its first appearance being probably in *Water Supply Paper No. 164*, eight or ten years ago:

"An honestly prepared boiler compound has many advantages. * * * Such compounds, when intelligently and carefully prepared, are efficient and satisfactory."

Recently two very carefully developed articles have appeared in the *Journal of the American Water Works' Association*. One by Milton F. Stein contains the following paragraph, referring to the results of the reactions where lime is used to precipitate the carbonates of lime and magnesium:

"The calcium carbonate formed is only soluble to the extent of about 13 p.p.m. and so precipitates out. The magnesium carbonate, being soluble to the amount of about 100 p.p.m., remains in solution to that extent, and requires additional lime for its removal as the insoluble hydroxide. At least this is the theory, but in practice such ideal conditions do not obtain. The solubility of the calcium carbonate as precipitated from a solution seems to be greater than the amount which can be dissolved by shaking it in the powdered form with water. The presence of magnesium carbonate affects the solubility of calcium carbonate, as there appears to be a definite limit to the combined solubility of the two salts. The presence of other compounds, particularly sodium chloride, tends to increase these residual solubilities, and they are also affected by the temperature of the water. The magnesium hydroxide forms very slowly and is apt to assume a colloidal condition, and to return to its former state by absorbing carbonic acid from the air."

Then, with reference to the reaction, using carbonate of soda, he states that the use of soda ash is on a more precarious basis, due to the fact that in the cold the reactions occurring are very sluggish and sometimes are not even completed.

In the same number of this journal appeared an article by W. A. Sperry of Grand Rapids, who opens his article with the following sentence: "To soften water with lime is

beautifully simple in theory, but in practice there are difficulties that are both vexing and perplexing."

Among the difficulties, he gives one: "The fact that approximately 30 p.p.m. of the calcium carbonate produced is soluble, varying somewhat with the temperature and pressure"—and again—"Contrary to the general rule, calcium salts are more soluble in cold water than in warm, the completeness of reaction being greatly accelerated or seriously retarded by an increase or decrease of temperature, as in changes from summer to winter conditions, with a corresponding change in the time element necessary,"—and again—"The ideal condition for a lime softening plant is expressed in some form of the hot water softening system."

In both of these articles, the point discussed was what change or improvement should be made in the method of treating to eliminate this incompleteness of reaction as well as the development of what are called "after deposits," and in both cases the fallacy of putting too much faith in a method of such antiquity is emphasized.

If heat is necessary to complete a reaction, and this heat is obtained in the neighborhood of the boiler, the only difference between this method of treatment and that of the so-called interior treatment is that in one case materials are present to control the separation of the incrusting salts in the boiler, and in the other nothing at all is present, and the precipitate usually forms in a distinctly crystalline condition and deposits just as though no treatment of any kind had been attempted.

Another point that the writer of this article went into great detail on was that relative to foaming. Much has been done in the way of foaming, and much has been learned. Many complicated causes have been detected, but it is recognized that concentrated soda salts stimulate as well as create a foaming tendency.

The matter of boiling is considerably more than the forming of steam bubbles. It is a matter of getting the steam bubbles out of the water and into the steam spaces, and foaming more than anything else, is a matter of surface tension. Surface tension is the force developed to hold together the film of water which makes the division between the liquid and the gaseous space above. The increase of certain soluble salts makes this film tougher, and the presence of other salts makes it weaker. So far as we know to date, inorganic compounds invariably increase the surface tension, and, if, in addition to the increased concentration of soda salts, which are the principal soluble salts to be reckoned with, there is an increase in the quantity of sludge in the boiler, there will be increased foaming because there will be more bubbles trying to break through this surface film.

However, there is quite as apt to be sludge in the boiler from an outside treated water as from an inside treated water, and, in the first case, the sludge is quite apt to be crystalline and get nearer to boiler surfaces, and just as apt to become the nucleus of the steam bubbles as the other sludge, which in many cases of interior treatment is intentionally controlled through organic materials, which not only assist in making this sludge light and flocculent, but, through their organic qualities, exert an action upon the surface film, making it less tenuous and more liable to break when the bubbles reach it.

With reference to the ideas regarding soda ash, it is not necessary to specify all the discussions. All of the authorities referred to in this article have made statements of more or less definite character on the importance of soda salts in stimulating foaming. Dole and Stabler, working for the United States Reclamation Service, and attaching their names to numerous publications of the government, are very definite with reference to its qualities. Quoting from one of the government bulletins to which R. B. Dole's name is attached is the following:

"Foaming is believed to be due principally to sodium and potas-

sium, which remain in solution after most of the other bases are precipitated, and which increase the surface tension of the water. The increased surface tension tends to prevent the steam bubbles from bursting and escaping. Other factors undoubtedly affect or cause foaming, but sodium and potassium are the chief causes."

With reference to the use of an anti-foaming compound, it is true that the United States government, through the agency of the United States Railway Administration, conducted a test on one of the western railways, using a commercial anti-foaming preparation of relatively high quality, and, as a result of this test, published a bulletin in which it was shown that with the treatment in question it was possible to increase the total mileage two to three times over the normal at which the water foamed before this type of trouble would begin to be experienced. This service would greatly reduce the expense of boiler washing and real data rather than guesses proved that the savings were well worth considering.

D. K. FRENCH,
Directing Chemist, Dearborn Chemical Co.

Rough-Riding Passenger Cars

SMALL TOWN, N. Y.

TO THE EDITOR:

Your remarks from time to time on the passenger transportation problem are to the point. I often have to travel and by nature prefer to go by rail rather than road. I have a keen interest in the railroad on which I live, having money invested in it and having been employed by it. And yet I usually travel by motor for two reasons—the bad riding quality of the coaches, and lack of punctuality. The steel coaches of this company were originally equipped with the orthodox six-wheel truck and were quite comfortable to ride in. Since then they have substituted a truck which, for maintenance, may be an improvement but for riding qualities is worthless. The trouble is due to the weight being carried entirely on short plate springs rather than partly by coil springs as in the conventional truck. This sets up a vibration in the interior of the car causing a sensation on the ear drums only one degree less annoying than the noise emitted by a locomotive when standing with a hole in the fire.

Nowadays the aim seems to be the building of a ponderous car to withstand collision but with no thought as to comfort. As I sit in one of these battering rams and try to divert my thoughts from the vibration, I wonder how much of my fare is absorbed by a car weighing 75 tons instead of 50 tons of the coach of 20 years ago. The thought comes that in automotive engineering, steel has been substituted for wood, without any increase in weight or decrease in strength; that the tendency has been to build motor cars lighter; that the lesser weight has been accompanied by better riding qualities through better suspension; that, although collisions with other vehicles and with trains at crossings occur, often with serious fatalities, the automobile is not built armored for these occasions.

On the other hand, when I travel in an English passenger coach 70 ft. long and weighing less than 40 tons, I appreciate how comfortably it rides, how all the shocks and noises are deadened. The reason is that the designer deliberately tried to do it. The wheels, for instance, have a wooden filler between the hub and rim; the long wheelbase of the truck, the long springs making contact with the truck frame through rubber blocks all contribute to the desired end. We frequently criticize the British for not profiting by our methods of handling freight. Why don't we profit by their way of handling passengers?

W. G. LANDON.

THE ST. LOUIS (Mo.) Chamber of Commerce invited the Chicago city passenger agents of various railroads to be its guests in St. Louis on April 15 and a party of 75 Chicago passenger representatives attended.

Modern Tendencies in Locomotive Design*

Need of Increased Economy in Use and Production of Steam; Turbine and Internal Combustion Locomotives Possible

By James Partington

Estimating Engineer, American Locomotive Company, New York

THE TYPES, weights and general details of construction of locomotives have undergone striking changes in the last 20 years. A study of these changes will show in a great measure the modern trend of locomotive design.

Modifications of type may be briefly summarized as follows: Eight-wheel passenger locomotives have been superseded by Pacific and Mountain types; Consolidation freight locomotives have been superseded by Mikado and Santa Fe types, and to some extent by Mallets; four and six-wheel switchers have been, to a large extent, superseded by eight-wheel switching locomotives.

The weight per axle has been increased from time to time as track and bridges would permit so that 60,000 lb. per axle is a common axle load today and 70,000 lb. is sometimes reached.

The boiler of moderate size with a narrow firebox between the frames or between the drivers has been superseded by a modern steam plant with wide firebox above the wheels, fitted with superheater, brick arch, flexible staybolts, feedwater heater, thermic syphons, circulating devices, combustion chambers, exhaust steam injectors, etc.

Stephenson valve gear and slide valve cylinders have been superseded by piston valve cylinders with outside steam pipes and outside valve gears of a number of different types.

Some Prime Requisites

All locomotives should conform to certain prime requisites that may be stated as follows: (1) A drawbar pull that will handle the largest tonnage that road conditions permit; (2) The production and delivery of drawbar horsepower at minimum cost; (3) Careful designing to embody road standards, to meet Interstate Commerce Commission requirements and to keep maintenance charges down to a minimum.

To meet the first requirement all the physical conditions of the road must be carefully studied, the horse power curves of different types of locomotives at the speeds they will have to operate analyzed and the type selected that best fulfills the needs of the service.

Importance of Economy

In designing locomotives to meet the second requirement, all the devices which make for economy of fuel must be considered. The application of a brick arch in the firebox and a fire-tube superheater are items of general design which have shown noteworthy reductions in coal and water and are being applied in all modern locomotives. The use of a feedwater heater or an exhaust steam injector is a comparatively recent development in American practice although each of these devices has shown marked saving in fuel in European operation. The use of these is now becoming more common on our railroads. On many designs of locomotives the use of a combustion chamber, providing a longer flame-way and an opportunity for secondary combustion before the flame and gases enter the tubes, shows an economy which is available with but slight additional first cost.

A more careful consideration of diameter of tubes as a factor of the length over tube sheets may also be cited. For the best results with bituminous coal the length of the

boiler tubes should be approximately within the following limits:—

Out. diam. of tube	Distance over tube sheets
2 in.	18 ft. 0 in. to 19 ft. 6 in.
2¼ in.	22 ft. 6 in. to 24 ft. 6 in.
2½ in.	28 ft. 0 in. to 30 ft. 0 in.

These proportions are based on the evaporative values of tubes of varying lengths and can serve only as a guide in deciding tube diameters, especially for the intermediate lengths not covered by the table where a choice of either of two diameters can be made without sacrificing efficiency. For example, 2 in. or 2¼ in. tubes may be used for a length over tube sheets of 21 ft. unless there are special conditions of draft or fuel which require separate consideration.

The tendency which was frequently indicated after the introduction of superheaters, to curtail the steam space of the boiler, is being avoided to as large an extent as possible in the locomotive of today. Sufficient steam space and a throttle designed and located to deliver dry steam to the superheater are recognized items having an important bearing on the performance of the locomotive.

The type of throttle usually applied now is designed to permit entrance to the boiler through the dome without removing the throttle, thus avoiding the use of an auxiliary or inspection dome.

The boiler and cylinder proportions of modern locomotives are such that extravagant forcing of the fire is unnecessary, the heating surface and the grate area being sufficient to provide the maximum amount of steam required with a coal consumption per square foot of grate per hour not exceeding 120 lb. for bituminous coal, and not exceeding 55 lb. to 70 lb. for anthracite.

Present day locomotives are usually designed to be as large and powerful as the roadbed, bridges and clearances will permit. This makes it necessary to apply automatic stokers to supply the large amount of coal consumed, the limit per hour for hand firing by one fireman being about 6,000 lb.

In connection with the economical production of steam there are a number of other devices coming into use, important among which the following may be mentioned:

The application of two or three thermic syphons; the number depending on the width of the grate. These provide a considerable amount of additional heating surface in the most effective location, i. e., in the firebox, and contribute toward a better circulation of water over the firebox crown.

Another method of improving circulation which has been applied on a number of recent locomotives, embodies the application of a horizontal plate laterally in the boiler shell, located so that about one-half of the tube heating surface is above this plate, the balance below it, causing a lower circulation of water toward the back tube sheet and sides of the firebox and an upper circulation forward.

A generous use of flexible staybolts is noticeable in all modern boilers on account of the noteworthy saving in frequency of inspection and cost of renewals.

On account of the weight necessary to provide for boilers of ample size and the auxiliary attachments necessary for the most economic production of steam, the weight of the machinery parts must be carefully proportioned to keep them down to a safe minimum. This has caused a demand for the

*Abstract of a paper presented April 7, 1922, at the Newport News meeting of the American Society of Mechanical Engineers, Virginia Section.

employment of special alloy steel for many parts subject to severe stress and fatigue.

To secure materials which can be readily repaired or replaced by the ordinary railroad shop the present trend is toward the employment of alloy steels which will give the required additional strength and tenacity without the necessity of heat treatment of these special forgings.

The employment of a booster to gain additional tractive power by utilizing the adhesive weight on truck wheels and the application of cylinders on the tender in a number of cases may be noted as one of the recent developments intended to provide increased tractive power for emergencies, such as short steep grades, starting trains on a grade, etc.

Maintenance Cost Must Be Kept Down

In designing locomotives to meet the third requirement—keeping down the maintenance charges—the engineers of the railroads and of the locomotive builders are giving special attention to the following points:

Careful determination of the stresses in all parts of the locomotive and tender and securing proportions and materials which will withstand these stresses and avoid costly failures in service.

Adoption of designs which will reduce the number of parts as much as possible thus keeping bolted connections to a minimum.

Avoidance of construction which cannot readily be removed for repair or renewal or repaired in place at reasonable cost.

Due consideration of the question of lubrication and making the engine parts accessible for lubrication and inspection. Nearly all bearings on modern designs are arranged for grease lubrication.

Possible Future Developments

Whether the design of locomotives of the future will continue along conventional lines will depend largely on experiments along new lines and the success or failure of such experiments.

The writer believes we will see more successful adaptation of three-cylinder locomotives in which the advantages secured will be greater and the complications of construction will be simplified. Increased efficiency will also be sought by the employment of higher boiler pressures and higher degrees of superheat. To secure higher boiler pressures without entailing prohibitive increased charges for boiler maintenance, a new type of boiler may be necessary. To secure higher degrees of superheat, the changes involved can readily be worked out and adapted as required.

It may be that the merits of internal combustion will be tested out on our railroads, although the complications involved do not appeal strongly to the maintenance departments. Several locomotives of this type are being developed in other countries.

Progress is being made abroad in condensing turbine driven locomotives and the results thus far obtained have been encouraging.

Further improvements in the draft appliances and reduction in the back pressure of exhaust are being diligently sought. The improvement of locomotives from the standpoint of design and operation is a fascinating subject on which much time and study has been expended in the past, is being expended at the present time and will undoubtedly attract as much if not greater effort in the future. The promise of the future is bright. May the accomplishments of the next decade equal, yes, may they exceed what has been attained in the past one.

Discussion

L. D. Freeman, (*assistant superintendent Motive Power, Seaboard Air Line*): An interesting feature in the design of modern locomotives is found in a comparison of the Mountain type locomotive of Seaboard Air Line

with locomotive No. 50000 built by the American Locomotive Company in 1910. In 1913 the largest passenger locomotive on the Seaboard Air Line was a Pacific type of 36,000 lb. tractive effort, the maximum permissible wheel load at the time being 47,000 lb. per pair of driving wheels, necessitating double-heading on regular trains.

Based on the proportions of locomotives No. 50000, ten Mountain type locomotives were built in 1914 by the American Locomotive Company having 47,800 lb. tractive power and weighing 209,000 lb. on four pair of drivers, or 52,250 lb. average per pair, which is still the maximum permissible wheel load on that road. After experience with these locomotives five more were built in 1917 and ten more in 1922.

The performance of these locomotives over a period of seven years indicates that the original design was correct and no changes were found necessary in the two repeat orders. It is felt that in view of this performance the statement that the basic principles developed in the design of locomotive No. 50000 were correct is fully justified.

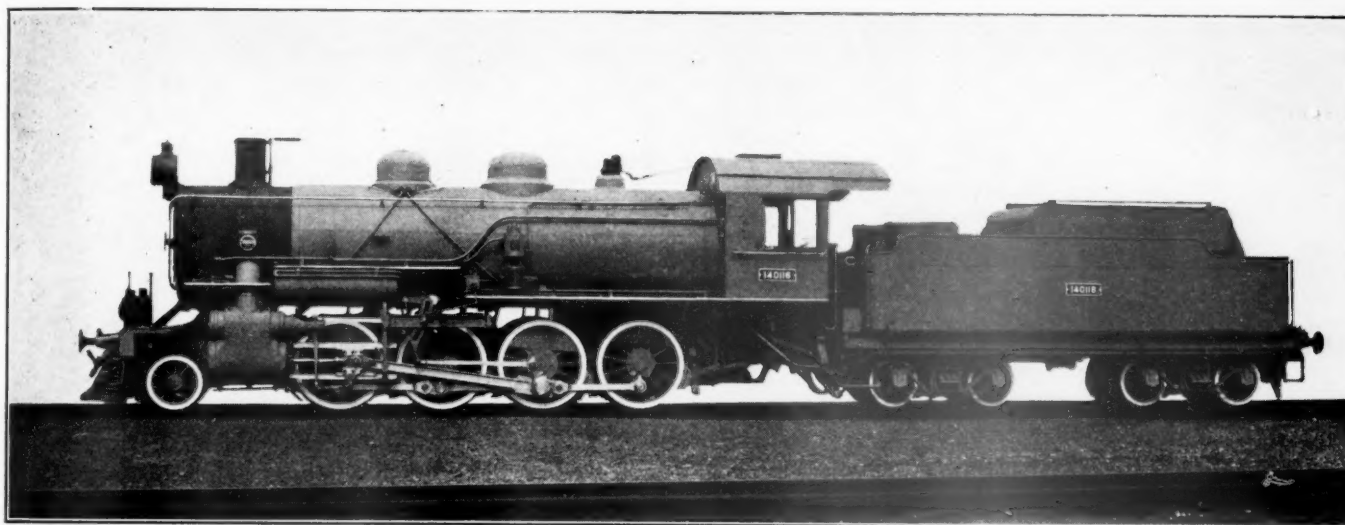
The locomotives in question are successfully operating over a very congested section of single track regularly handling 11 steel cars weighing 75 tons each or 825 tons behind tender at 28 m.p.h. over ruling grades of 1.1 per cent with a maximum speed restriction of 50 m.p.h. over a division of 154.7 miles, making an average speed of 34.9 m.p.h. On the next division under the same conditions the train is handled 202.3 miles, making an average speed of 36.7 m.p.h. When conditions require, these locomotives handle up to 13 cars weighing 75 tons each, or 975 tons behind the tender over the 1.1 per cent ruling grade at 22 to 25 m.p.h. and maintain the regular schedules.

The average fuel consumption in winter months is 120 lb. of coal per locomotive mile with an average of 12 cars per train which takes into account the varying condition of the entire group of locomotives of this class. The first ten locomotives have performed since 1914 a total average mileage of 370,000 per engine, with an average mileage between the general repairs of 95,000 miles and in a few exceptional cases of 180,000 miles, indicating proper design of details.

In recent years many improvements tending to economy in steam production have been made in the locomotive boiler by the addition of superheaters, brick arches, feedwater heaters, mechanical stokers, power grate shakers and improvements in grate arrangements, ash pans and front ends.

Unfortunately the same degree of improvement in the use of steam in locomotive cylinders has not been attained. After nearly a hundred years of locomotive building we have still retained the slide valve, or in cylindrical shape the piston valve, to admit steam to and to exhaust steam from the cylinders, the latter with increased cylinder clearances. The most objectionable feature in connection with the use of a single slide valve or piston valve is the fact that when the valve travel is decreased to reduce the steam cut-off the exhaust closes earlier, causing high back pressure and necessitating comparatively large cylinder clearance space to prevent compression in excess of boiler pressure, which results in considerable loss due to the comparatively low ratio of expansion at short cut-off and early release periods.

Experiments are now being made of applying to a locomotive a valve arrangement consisting of four valves for each cylinder, two for intake and two for exhaust, operated by a modified Walschaert valve motion, the object being to apply the best principles of the four-valve non-releasing Corliss valve mechanism as used in high speed stationary engines to a locomotive, with a view of reducing the cylinder clearance, delaying the exhaust closure to reduce the back pressure and increase the ratio of expansion by providing a constant point of exhaust opening independent of the point of cut-off of the steam inlet valves. While this arrangement is still in the experimental stage it appears to point the way for a substantial increase in steam economy for locomotives.



On a Previous Trip Mr. Vauclain Sold to Roumania 50 Locomotives Like This

An Interview With Samuel M. Vauclain

Returns from Extensive Trip in Europe and Discusses
Economic Conditions There

IN 1920, Samuel M. Vauclain, president of the Baldwin Locomotive Works, spent some two months in Europe, his itinerary including France, Poland, Roumania, Serbia and England.

The substance of an interview with Mr. Vauclain in his London office, given just before he left for America, appeared on page 1506 of the May 28, 1920, issue of the *Railway Age*. Later, on September 21, 1920, Mr. Vauclain talked in more detail about his trip at a meeting of the Western Railway Club in Chicago. Summed up, the contracts for locomotives made by Mr. Vauclain during his 1920 trip as modified later, were as follows: 150 Consolidations for Poland, payable in Polish government bonds; and 50 of the same type for Roumania, payable 10 per cent in either cash or oil, the balance to be covered by government notes payable in 60 monthly payments either in oil or in cash plus 6 per cent interest, and 1 per cent yearly for financing, the interest to be included in the face value of the notes. The contract for 50 engines was supplemented by orders for a lot of spare parts and \$507,000 worth of machinery and supplies.

On December 14, 1921, Mr. Vauclain again went abroad, returning to the United States on February 15, last. This time he covered much of the same ground, visiting Paris; Brussels, Antwerp and Liege, Belgium; Essen and Berlin, Germany; Stockholm and Gothenborg, Sweden; Christiania, Norway; Warsaw, Poland; Vienna, Austria; Budapest, Hungary, and London.

During the 1920 trip Mr. Vauclain wrote in some detail to the Philadelphia office, interspersing business transactions with accounts of people he met and the way in which he was entertained by royalty and others, and with observations of the countries through which he passed, their people and activities. The letters proved "so full of human interest, keen business observation and humor" to those at the home office that they were reproduced in pamphlet form "for the confidential information of directors, officers and foreign sales organization of the Baldwin Locomotive Works; also for a few of Mr. Vauclain's friends."

Our London interview in 1920 having proved fruitful, we approached Mr. Vauclain some days after his return to

Philadelphia from his last trip; and in his usual frank manner he talked freely about the results of his observations. As in 1920, he kept his office informed of his doings; and these letters, too, are being put in type for limited circulation.

Paris having been Mr. Vauclain's first, as well as his next to last objective, it was but natural that he should first discuss France. He was astonished at the progress made since his previous visit in reconditioning the French railways, particularly the all but war-destroyed Nord, and in rebuilding the towns which were demolished, in whole or in part, during the war. Generally, the French trains were on time, the cars clean and the roadway smooth. As to locomotives, Mr. Vauclain found that the railways have a sufficient number in good condition and that there is no chance that any will be bought outside of France for a long time to come, the locomotive building shops of the country having ample facilities for taking care of normal requirements.

In Belgium Mr. Vauclain found considerable industrial activity, although labor conditions were far from good. Many factories that had been dismantled by the Germans during the war were being rebuilt with machinery supplied by Germany under the reparations agreement.

As to Essen, Berlin and Germany, generally, Mr. Vauclain made a number of facetious remarks about the time consumed and the trouble to which he had been put in getting in and out of the country. At Essen he found that part of the Krupp plant which he visited to be working under severe handicaps in the way of obsolete machinery and methods, the only compensating feature from the viewpoint of competition being the cost of labor, which is only about 10 per cent of what we pay for similar work. The locomotive shop was turning out only about one engine a day. At the time of his visit, Germany was in the throes of a railway strike. He found the cars dirty and the morale of the train crews at low ebb. "One could buy the whole train from the conductor," he said; adding, "It was worse than in Russia in 1914 and it will require a long time for Germany to correct it."

In Sweden Mr. Vauclain found the country alive with activity. The various locomotive builders were busy in their comparatively slow way on the order for one thousand engines

for Russia. At the rate at which they are being turned out the order will not be filled until 1926. All of the locomotives are being assembled at the plant of the Russian-Swedish Locomotive Works at Trollhattan, near Gothenborg, and shipped to tidewater by canal. Mr. Vauclain pronounced as good both materials and workmanship of the locomotives.

Contrary to Sweden, Norway was found to be commercially stagnant, due to a severe depression in its fisheries, the life of the nation.

From Stockholm, Mr. Vauclain had intended to go to Russia; but on advice he decided to postpone his visit indefinitely, especially as at that time troops were being massed on the Finnish border.

As to Poland, Mr. Vauclain found marked progress since his visit in 1920; but he does not look for much business for America until a way can be found to provide the country with much needed working capital. He hopes that Americans with real vision will appreciate the possibilities for increasing our exports to Poland and furnish the necessary credit.

Czecho-Slovakia seemed to Mr. Vauclain to be teeming with prosperity, while Austria, especially Vienna, was in a pitiable state of inactivity. Hungary he found fairly prosperous and busy.

When asked specifically about the chances for orders for locomotives in the near future from the countries of Central and Western Europe, Mr. Vauclain said: "All of the countries are amply supplied, with the exception of Poland and Roumania. They could use a few more profitably; but with us negotiations are out of the question because of the necessity Works have been pioneers in the matter of trading sity for extending long time credits. The Baldwin Locomotives for commodities and the outcome to date has been very satisfactory. However, I feel that for the present we have done all that we should."

Coal Production During First Week of the Strike

WASHINGTON, D. C.

THE TOTAL production of all coal—anthracite and bituminous—in the first week of the strike was the lowest in modern coal history, according to the weekly bulletin issued by the Geological Survey. The output of bituminous coal dropped to approximately 3,500,000 tons, and in the anthracite region work ceased entirely. During the 1919 strike the anthracite mines operated at capacity.

The reports so far received consist of the number of cars loaded on each division of 130 of the principal coal-carrying railroads. They show that from 60 to 64 per cent of the bituminous tonnage of the country has been closed by the strike. Of the remaining tonnage a significant portion had not been operating recently for lack of demand. In the first week of the 1919 strike 71 per cent of the tonnage was closed. The smaller portion closed during the present strike is partly explained by the fact that certain organized districts whose contracts did not expire on April 1 have continued to operate.

The following statement shows the cars of soft coal loaded daily, according to telegraphic reports received from the carriers. As April 1 is a union holiday, loadings on that day did not reveal the extent of the strike. The first test came on Monday, April 3. On that day 11,445 cars were loaded, against 38,056 cars on the preceding Monday. Another loading for the balance of the week was: Monday, April 3, 11,445; Tuesday, April 4, 11,019; Wednesday, April 5, 11,411; Thursday, April 6, 11,061; Friday, April 7, 11,323; Saturday, April 8, 8,881; Monday, April 10, 10,773. During April, 1921, the average loading was 20,054 cars a day and for the year 1921 the average daily loading was

24,295. The total output for the week will be in the neighborhood of 3,500,000 tons. In the first week of the 1919 strike 3,582,000 tons were produced.

Reports from all non-union fields to the National Coal Association state that production is running at various rates from 40 per cent to 70 per cent or 80 per cent of normal and that the only reason for the failure to produce more is the indifference of consumers. Thousands of cars of coal are standing on the mine sidings and in railroad yards awaiting billing orders from consumers. Consumers are said to manifest no anxiety with respect to their future stocks of coal. Large amounts of coal produced in the union fields during the last week before the strike are remaining unsold upon the sidings.

The week's output falls short of what the mines not affected by the strike can produce if the demand is active. From mines in many non-union districts reports of "dull market," and "no orders" have been received, and there is a large number of loaded cars unbilled on the sidings, some of which are in fields closed by the strike. Even during the week before the strike it was reported that 30 per cent of full-time output was lost because of no market.

Production of soft coal continued to increase during the last five days before the strike, but because of the decline on Saturday the total output for the week ended April 1 was less than the week before. Including lignite and coal coked, the production is estimated at 10,453,000 net tons.

The record of production during March removed all reasonable doubt that the 52,500,000 net tons of soft coal in the hands of consumers on March 1 had increased to 63,000,000 tons, or more, by the opening day of the strike. The quantity on hand on April 1 was therefore equal to the maximum stock at the end of the war.

At the rate of consumption prevailing in January and February the reserve in the hands of consumers April 1 was sufficient to last 52 days, if evenly divided. But stocks are never evenly divided. There are some consumers who store virtually no coal, and in some entire states the average stock is much lower than in others. Further, a certain minimum reserve is necessary for steady operation of utilities.

Back of this stock of 63,000,000 tons in the hands of consumers April 1 there was a further reserve of over 4,000,000 tons on the Upper Lake Docks, and a smaller quantity stored on the ground at the mines or at intermediate storage yards. These figures take no account of the coal on wheels, including a heavy tonnage of unbilled loads on hand at the mines when work stopped in the union districts on Saturday.

Anthracite is stored commercially in three places—in retail coal yards, on the Upper Lake Docks, and in the storage yards of the producers. Retail coal dealers' stocks on March 1 were about the same as a year ago, but much larger than in 1919 and 1920. Stocks on the Lake Docks were 821,000 tons on the same date. No statistics of anthracite in producers' storage are available for March 1. On November 1 last there were 4,500,000 gross tons in the yards, of which 40 per cent was domestic sizes. In addition there is a surplus of 1,000,000 tons of coke on hand at by-product coke works, much of which may be considered a substitute for anthracite.

Under the stimulus of heavy demand due to the approaching miners' strike, production in March passed the 50,000,000 ton mark. Estimates based on statements of cars loaded place the total at 50,193,000 net tons, against 40,951,000 tons in February. This was the highest record for any March during the past ten years, the period over which the Geological Survey's records of monthly production extend. In round numbers, this was an increase over March, 1921, of 19,800,000 tons, or 64 per cent, and it even exceeded the corresponding month in the war years 1917 and 1918 by more than 2,000,000 tons.

The total production during the coal year 1921-22 is estimated at 434,279,000 tons, the lowest for many years.

Daniel Willard Testifies Before Senate Committee

President of Baltimore & Ohio Refutes Statements of Messrs. Warne and McAdoo

WASHINGTON, D. C.

DANIEL WILLARD, president of the Baltimore & Ohio, on April 8 completed his statement before the Senate Committee on Interstate Commerce in rebuttal of statements reflecting on the railroads made by W. G. McAdoo and Frank J. Warne.

Mr. Willard concluded his statement with the following summary:

"In conclusion, I gathered from a careful reading of his statement before this committee that Mr. McAdoo desired to show:

1. That the railroads under private management and previous to federal control had broken down as transportation agencies, and that it became necessary on that account for the President to take possession and assume control of the railroads as a war measure.

2. That the operation of the railroads while under federal control had been much more efficient and economical than under private control, and that the properties were returned to their owners on March 1, 1920, with facilities and equipment much improved.

3. That the railway managers found it necessary soon after the termination of federal control to call on the Interstate Commerce Commission for help, and, further, because of the abandonment of the unified practices introduced during federal control, the operation of the roads under their owners was less efficient and less economical in 1920 than it was during the period of operation by the director general.

No Breakdown of Railroads

"I have endeavored to show to this committee that not only had the railroads *not* broken down as transportation agencies in 1916 and 1917, as stated by Mr. McAdoo, but that on the contrary they performed in 1917 the greatest transportation service ever accomplished up to that time.

"I do not question Mr. McAdoo's statement that the railroads were efficiently operated while under federal control and that they met the transportation requirements incidental to the government's war program. Freed from all the restrictions surrounding their operations during the previous year, it is not surprising that the railroads in 1918 should have been able under governmental control to move in the aggregate approximately 2 per cent more tonnage than they moved in 1917.

"The contention of Mr. McAdoo that the railroads were returned to their owners in better physical condition than when taken over by the President can not, in my opinion, be sustained, but whether it can be sustained or not, that question has no direct bearing whatever upon the merits or demerits of federal control. It does, however, involve an important question or fact. If it is true, as the railway managers claim, and as I believe, that the condition of the carriers as a whole was lower at the end of federal control than at the beginning, then the difference in standard, however great, must be made up, and unless it is made up from monies paid to the carriers by the director general on account of under-maintenance, it will, of course, have to be done with monies collected from the people through the medium of transportation charges. The question itself has a very intimate relation with the future basis of rates.

Traffic Record Broken in 1920

"It is true, as Mr. McAdoo states, that the railway managers did take up with the Interstate Commerce Commission shortly after the termination of federal control, and as contemplated in the Esch-Cummins act, certain matters pertaining to the then transportation situation. It is also true that in co-operation with the commission, and in full accord with the provisions of the act, the railroads under private management in 1920 were able to move and actually did move nearly 2 per cent more ton-miles than they ever moved before under any circumstances. It seems to me that the results so obtained not only justified the carriers in their action, but also fully justified the act itself.

"I have not attempted to reply in a critical manner to the criticisms—personal or otherwise—contained in Mr. McAdoo's statement. In fact, I am inclined to believe that the real merits of the questions actually before this committee have been obscured and made more difficult of ascertainment because of too much criticism on both sides.

Railroads Taken Over Only for War Purposes

"My own judgment leads me to the following conclusions:

1. Congress itself acted wisely in 1916 when it made provision in advance for the taking over of the railroads by the President whenever

such action in his judgment should seem necessary as a war measure.

2. The President, under the circumstances, acted wisely when in the exercise of the power granted him as a war measure, he took possession of the railroads on December 28, 1917.

3. After the Armistice there was certainly no reason why the President should longer retain possession of the properties as a war measure. It was recognized by all, however, that it would be both unwise and destructive to terminate federal control until Congress should provide a better method of regulation than had been in effect previous thereto. Owing to the magnitude of the problem so presented to Congress, it was necessary to prolong the period of federal control until March 1, 1920.

4. Inasmuch as Congress had never authorized the President to take possession and assume control of the railroads for the purpose of developing the relative merits of private ownership and operation versus Government control and operation, any steps in that direction which were taken during the period of federal control and which resulted in any manner inimical to the best interests of the public or of the carrier properties so seized, were unfair, unwarranted and illegal because they were not justified by law.

5. Congress itself having decided upon the policy of private ownership and operation of the railroads, with governmental regulation, provided by suitable legislation for the continuance of the method so determined upon. Nothing has yet developed to show that Congress erred in its decision either to terminate federal control and operation, or in the scheme of regulation which it provided for the future operation of the roads, while much that has happened since the termination of federal control, tends to justify the action of Congress and confirm the wisdom of the Transportation Act.

What the Railroads Need

6. What the railroads need more than anything else at the present time is an opportunity under the terms of the act to work out their problems without unnecessary and burdensome interference, and I have the utmost confidence that they will successfully surmount their present difficulties if given a fair chance to do so. I am also confident that they will provide the people of this country with adequate transportation at reasonable rates and lower rates than are to be found for similar service in any other country in the world. This the railroads did do under the faulty scheme of regulation in effect before the war, and much more should they be able to do so under a better and wiser scheme of regulation now in effect."

Mr. Willard Stands on His Record

Mr. Willard said it had not been his intention to refer to the letters introduced by Mr. McAdoo, which he had written shortly after becoming director general in 1918 to a number of eastern railroad presidents, expressing dissatisfaction with the operation of their roads, but at the request of members of the committee he submitted a statement outlining his railroad experience of 40 years, beginning as a track laborer and recently having been chosen by the railroads of the United States as chairman of the advisory committee of the Association of Railway Executives and chairman of the board of directors of the American Railway Association.

Mr. Willard also pointed out that while he was serving the government in Washington in 1917 the Baltimore & Ohio under his general direction had handled more freight business than ever before, 19 billion ton-miles, and that for 1920, when he resumed its management after the expiration of federal control it also performed more freight service than ever before, 21,600,000,000 ton-miles, as compared with 17,700,000,000 in 1918 and 17,900,000,000 in 1919. He also said Mr. McAdoo's letter criticizing the performance of the Baltimore & Ohio and other roads was written on January 17, 1918, only 21 days after he had become director general, without consultation with him or any officer of the Baltimore & Ohio regarding its conditions, and only six days after Mr. Willard had resigned as chairman of the War Industries Board to devote his entire time to the Baltimore & Ohio.

Regarding the alleged dismissal of the railroad presidents in May, 1918, Mr. Willard said that C. H. Markham, regional director, had asked him to become federal manager of the eastern lines of the B. & O., but that he had elected to remain with the company. He said that he and President Rea of the Pennsylvania had been called to Washington to

see Mr. Hines, then assistant to the director general, and had been informed of the plan to separate the officers reporting to the companies and those reporting to the administration. Mr. Willard said they were told that undoubtedly Mr. Markham would be glad to appoint them federal managers but that it was assumed they would prefer to remain with their companies and they did so. "We were told we were not dismissed," he said, "but evidently something got crossed in their publicity department, because it was given out that we were fired."

Mr. Willard said he did not recall hearing any railroad president criticize the administration because of increasing the wages of railroad employees as a class, but he thought there was quite a general belief among railroad managers and others, which he shared, that with respect to rules and working conditions the director general made concessions that seemed unwise, uneconomical and unnecessary.

Regarding statements made before the committee by Mr. McAdoo, and by Mr. Warfield as to the economies to be realized by unification and joint use of facilities, Mr. Willard said he was inclined to think they were not fully advised concerning all that the railroads had done and are still doing in the way of joint use of facilities. As bearing upon this point, he filed a statement on this subject based on a questionnaire prepared by Julius H. Parmelee, director of the Bureau of Railway Economics, which he had used in his recent testimony before the Interstate Commerce Commission.

Denying numerous statements made before the committee by Frank J. Warne, Mr. Willard said the Baltimore & Ohio is not interested through stock ownership or otherwise in any company making commercial shipments of coal from mines tributary to its lines, or for that matter, from anywhere else.

B. & O. Has No Interest in

Commercial Coal Operations

"I have been president of the Baltimore & Ohio since January 1910," he said, "and from my personal knowledge the company has had no interest whatever in commercial coal operations since that time. The only interest the Baltimore & Ohio previously had in coal operations making commercial shipments, was in the Consolidation Coal Company. It did, as stated by Mr. Warne, own 52 per cent of the stock of that company, which in turn owned extensive operations in Maryland, Pennsylvania and West Virginia and from which company there was purchased at advantageous figures (the prices for years being from 85 cents to \$1 per ton) a large proportion of the railroad's fuel requirements. Anticipating the public sentiment which later developed against such dual ownership, the Baltimore & Ohio, more than 14 years ago, sold its entire interest in that company to former Senator C. W. Watson, of West Virginia, and his associates. Since then, as stated above, the Baltimore & Ohio has not been interested in any commercial coal operations on its lines or elsewhere. Mr. Warne could easily have ascertained the facts in this connection if he had desired to do so.

"For a time following this sale the Baltimore & Ohio held certain fixed interest bearing obligations of Mr. Watson and his associates, secured by a pledge of the stock which was deposited with the Empire Trust Company as trustee. In 1913, the purchasers paid these obligations in full and since that date the Baltimore & Ohio has had no investment or interest directly or indirectly in the Consolidation Coal Company.

"It is notable that despite the mass of data he submitted, Mr. Warne does not demonstrate generally, and certainly in the case of the officers of the Baltimore & Ohio he fails to establish a single instance where because an officer or employee had any such interest, it had in fact operated injuriously either to the railroad or the public, and it is also to be noted that notwithstanding their full investigation, conducted under the supervision of Mr. Justice Brandeis, the Interstate Commerce Commission in their report in the case (five per cent) made no statement that any improper relations or practice had been disclosed.

Some Other Facts Mr. Warne Overlooked

"Mr. Warne dwells at much length on the reply which was submitted by the Baltimore & Ohio to the questionnaire of the commission in the case just mentioned, because, as he states, that company furnished such complete information. Mr. Warne neglected to advise this committee, however, that in the answer

submitted by the Baltimore & Ohio, it was shown that *the chief executive*, the man who was directly and personally responsible for all of the affairs of the company, *was not interested in any way in any company with which the Baltimore & Ohio had business relations*, and furthermore that its purchasing agent and chief engineer, who reports to the chief executive, were not interested in any way in such companies.

"Aside from the fact that neither the president, purchasing agent or chief engineer of the Baltimore & Ohio (the three officers primarily responsible for all purchases and contracts entered into by the company) appear as being interested directly or indirectly in any corporation with which the company had transactions, the method used by Mr. Warne in presenting the subject to this committee was such as to exaggerate the situation and to give impression that a large number of the company's officers were interested in a great many institutions and that the situation he presented was that currently existing instead of one developed more than nine years ago. As a matter of fact this statement, on which Mr. Warne lays so much stress, gives the names of but 19 out of a total of more than 150 officers and directors of the company, and of the items he enumerates in 23 instances the parties named were bondholders where their interest was that of a creditor holding an obligation upon which they could receive only a fixed rate of interest.

"A review of the situation shows that of the more than 150 present officers and directors of the Baltimore & Ohio, only 10 in 1913 held interest in any one of the 20 concerns with which the company had transactions. Such interest was relatively small and in many instances the transactions involving so-called relationships were trivial. For instance, in three cases the parties appear as stockholders in a street railway company to which it chanced that the Baltimore & Ohio Railroad had sold through its purchasing agent some second-hand bridges, and in another instance a director was a shareholder in a trust company with which the railroad company maintained a small deposit account, and in another case a Baltimore & Ohio director was a shareholder in a trust company which had purchased a ground rent of \$29.72 upon property perpetually leased to the railroad company.

"Of the 19 directors and officers reported as having some interest, six are no longer associated with the company, three being dead and therefore unable to refute Mr. Warne's implications.

"I note particularly the name of Oscar G. Murray, formerly president and, at the time of his death, chairman of the board of directors of the Baltimore & Ohio. While Mr. Murray appears as having had an interest in a number of companies, in no case was this interest substantial, and from my long and intimate personal acquaintance with him, I am unwilling to believe that Mr. Murray used his position in such manner as to inure in any way to his personal or private advantage and to the disadvantage of the property of which he was in charge. Mr. Murray was a bachelor who lived within his income, and at his death left his entire estate in trust in perpetuity for the benefit of widows and orphans of Baltimore & Ohio employees. In view of Mr. Warne's wholly unsupported intimations, I have thought it not only proper but my duty to say this much with respect to the late Mr. Murray.

"I need hardly remind this committee of the fact that this whole question of dealings between common carriers and companies in which officers or directors may have substantial interest has been given consideration by Congress, resulting in the passage of the Clayton act, wherein it is recognized that the extent and character of the investments of individuals should not be controlled, but wherever substantial interest is had, purchases can be made only through complete competitive bidding as provided in the law.

"In view of the fact that this whole subject has had the consideration of Congress and legislation duly enacted protecting the railroads and the public, it might appear that I have given this question more space than its importance dictates, but it seems proper to show how false and misleading impressions can and have been drawn from such statements as those referred to and given such prominence in Mr. Warne's testimony when no real or substantial evidence in support is produced."

As to some of Mr. Warne's statements regarding railroad "propaganda" in the five per cent rate case, Mr. Willard said that while it is true, as Mr. Warne states, that he served as chairman of the committee of eastern presidents in the five per cent case, no publicity fund was raised or made use of in connection with that case, nor was a publicity committee appointed or charged with the duty of conducting propaganda. As chairman of the presidents' committee he did personally appear before and address the members of many trade organizations, commercial bodies, etc., in such cities as Boston, New York, Baltimore, Cincinnati, Chicago and others.

"I also wrote many letters in connection with the matter to the publishers of newspapers," he said, "and particularly so when I observed statements in such papers that from my point of view were incorrect and misleading, and it is a fact that the public became very much interested in that rate case and seemed to be sympathetic with the contention of the carriers, and if we may judge at all by subsequent expressions which have appeared in the public press and which have even been given voice on the floors of Congress itself, it is at least an open question whether in that particular case the public was not more nearly right than the commission. However that may be, I maintain that the action of the railroads concerning the case was in every sense proper and justifiable. We knew, of course, that if the public, or particularly the trade organizations, believed our request for an increase in rates to be unjust and unwarranted that they would undoubtedly appear before the commission in opposition thereto, and consequently we made diligent, frank and intelligent efforts to bring the public, in advance, to our point of view. I am personally unable to see anything in connection with that phase of the question that was or is properly subject to criticism in a country and under a government such as ours.

"On page 1335 Mr. Warne uses the following words: 'In other words, you have your railroads organized as an operating machine; you have such men as Mr. Rea, of the Pennsylvania; Mr. Willard, of the Baltimore & Ohio; and Mr. Smith, of the New York Central; and other men whom I could mention, who are at the head of the operating side of the railroad machine. I believe emphatically that if those men had the determination of policies as to the relation of the railroads to the public, and the relation of the railroads to their employees, that the policies would be quite different than they are at the present time.'

"Naturally I have no knowledge whatever concerning the relations existing between Mr. Rea and Mr. Smith and their respective boards of directors. I do wish to say, however, that never at any time during the 12 years that I have been president of the Baltimore & Ohio has the board of directors endeavored directly or indirectly, or in any manner whatever, to influence me to pursue a line of action with reference to the public, to our employees, or concerning our financial requirements or the purchases we should make with which I was not in full and complete accord. On the contrary, the Baltimore & Ohio board of directors have given me their most complete support at all times, and if the policy of the Baltimore & Ohio company concerning any of the matters referred to by Mr. Warne has not been wise and enlightened, the fault is primarily mine and is not the fault of the Baltimore & Ohio board of directors. It is true, of course, that the board of directors at all times had authority to over-rule the president or to remove the president if they so desired; I wish to say, however, that at all times they gave me their most helpful and sympathetic advice and support."

In reply to a statement by Mr. Warne as follows: "Now, at one time the Pennsylvania Railroad owned a considerable amount of the stock of the Baltimore & Ohio. That has since been discontinued by what I think is a fictitious maneuver," Mr. Willard said:

"There is absolutely no foundation whatever for such a statement as is contained in the last sentence of this question. It is

true that at one time the Pennsylvania Company did own a substantial block of Baltimore & Ohio stock. I think its holdings at one time amounted to approximately 46 per cent of the entire Baltimore & Ohio stock issue at that time outstanding. Later on, however, it sold substantially one-half of its holdings to the Union Pacific, and for a period the Pennsylvania and the Union Pacific companies may be said to have had together a controlling interest in Baltimore & Ohio stock. At the same time the Union Pacific was the owner of a considerable amount of the capital stock of the Southern Pacific Company. In 1913 as a result of court decisions the Union Pacific decided to divest itself of its ownership of Southern Pacific stock and as a step in that direction the Union Pacific exchanged its Southern Pacific stock or some of it with the Pennsylvania Railroad for its Baltimore & Ohio stock. I have no knowledge whatever concerning the terms of the exchange so effected, but the result of the exchange gave the Union Pacific Company an ownership of approximately 46 per cent of the Baltimore & Ohio stock.

"In 1914 the Union Pacific company decided to dispose of its Baltimore & Ohio shares and they were distributed ratably as a dividend to all Union Pacific stockholders. The effect of the distribution was to increase the Baltimore & Ohio stockholders from 14,000, which had been the number previous to the Union Pacific distribution, to about 28,000, which was the number after such distribution. At the present time the Baltimore & Ohio Company has more than 36,000 stockholders, and the average holding is 60 shares per individual. We have 19,000 shareholders having 10 shares or less apiece. The largest single shareholder of the Baltimore & Ohio company today is the Oregon-Washington R. R. & Navigation Company, which is a part of the Union Pacific System. That company, as last reported, had in its treasury 50,000 shares of the Baltimore & Ohio stock. Neither the Union Pacific nor the Oregon-Washington R. R. & Navigation Company is represented on the Baltimore & Ohio board and neither company has any voice whatever in the Baltimore & Ohio management, or anything to do with the affairs of the company. The Pennsylvania Railroad Company has not held a single share of Baltimore & Ohio since the exchange was made in 1913 and to which I have above referred. The Pennsylvania Company has no representation on any Baltimore & Ohio board, nor has it any interest or influence whatever in any of the affairs of the Baltimore & Ohio Company. These facts have long been known to the public, and had Mr. Warne desired to know the truth concerning this matter he could have obtained full information from my office at the mere cost of mailing a letter of inquiry."

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight during the week ended April 1 showed a drop of over 19,000 as compared with the previous week, but an increase of 163,000 over the corresponding week of last year. The total was 827,011 as compared with 663,171 in 1921 and 858,827 in 1920. The decrease as compared with the week before is

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

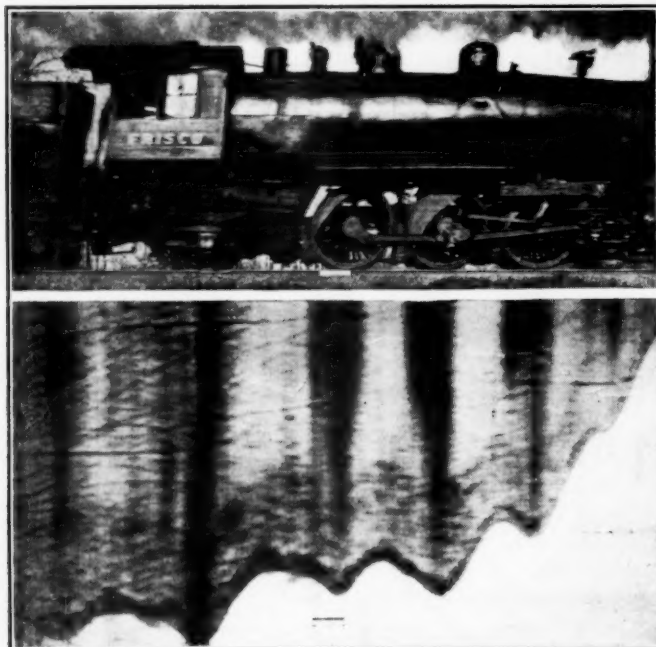
SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, APRIL 1, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded		
										This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	6,620	2,542	50,374	2,224	4,419	1,170	67,709	71,591	206,649	.....	.....
.....	1921	5,621	2,413	28,961	995	5,807	355	56,240	60,207	.....	160,599	210,655
Allegheny	1922	2,077	2,620	54,205	4,529	2,592	1,727	50,497	61,521	179,768	.....	.....
.....	1921	1,976	2,447	31,038	2,517	2,384	1,221	41,552	45,934	.....	129,069	191,919
Pocahontas	1922	211	69	24,907	241	1,316	30	6,082	4,356	37,212	.....	.....
.....	1921	144	63	12,700	171	1,300	36	4,929	3,123	.....	22,466	30,944
Southern	1922	3,150	2,156	23,602	541	18,396	685	39,336	44,674	132,540	.....	.....
.....	1921	3,003	1,693	14,988	485	13,141	768	35,074	40,806	.....	109,958	130,993
Northwestern	1922	8,841	7,054	7,539	1,255	16,588	586	28,389	31,104	101,356	.....	.....
.....	1921	8,066	6,535	4,226	566	13,465	616	27,070	23,940	.....	84,484	110,871
Central Western.....	1922	9,746	9,300	19,591	1,660	3,749	962	32,827	34,684	112,519	.....	.....
.....	1921	9,777	8,557	11,655	1,584	3,477	1,830	31,135	31,812	.....	99,827	119,837
Southwestern	1922	4,389	2,194	4,734	202	6,956	651	16,197	21,644	56,967	.....	.....
.....	1921	4,571	1,963	3,602	130	6,230	478	16,682	23,112	.....	56,768	63,608
Total Western Dists..	1922	22,976	18,548	31,864	3,117	27,293	2,199	77,413	87,432	270,842	.....	.....
.....	1921	22,414	17,055	19,483	2,280	23,172	2,924	74,887	78,864	.....	241,079	294,316
Total all roads.....	1922	35,034	25,935	184,952	10,652	54,016	5,811	241,037	269,574	827,011	.....	.....
.....	1921	33,158	23,671	107,170	6,448	45,804	5,304	212,682	228,934	.....	663,171	.....
.....	1920	31,916	28,170	168,676	14,876	64,183	17,416	172,481	361,109	.....	.....	858,827
Increase compared....	1921	1,876	2,264	77,782	4,204	8,212	507	28,355	40,640	163,840	.....	.....
Decrease compared....	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared....	1920	3,118	.....	16,276	.....	.....	.....	68,556	.....	.....	.....	.....
Decrease compared....	1920	.....	2,235	.....	4,224	10,167	11,605	.....	91,535	31,816	.....	.....
April 1	1922	35,034	25,935	184,952	10,652	54,016	5,811	241,037	269,574	827,011	663,171	858,827
March 25	1922	38,066	25,958	204,586	8,676	54,814	5,282	239,846	268,807	846,035	846,035	895,386
March 18	1922	39,896	26,722	190,683	8,502	54,599	5,310	237,538	260,119	823,369	691,396	855,060
March 11	1922	45,160	29,930	204,568	8,530	51,120	5,107	236,244	248,469	829,128	700,440	819,329
March 4	1922	49,520	28,329	196,639	8,257	47,664	4,651	231,433	236,762	803,255	711,367	811,106

entirely accounted for by the decreased movement of coal as this week included the first day of the strike. Increases as compared with last year were shown in all districts and in all classes of commodities. While a large part of the increase as compared with last year was the increase in coal loading which amounted to about 77,000 cars, there was also an increase of 28,000 in the loading of merchandise and of 40,000 in the loading of miscellaneous. The summary as compiled by the Car Service Division of the American Railway Association is given on the preceding page.

Applying Photography to the Study of Track Stresses

IN VIEW of the widespread interest which engineers and metallurgists are taking in the question of the magnitude of the stresses which exist in rails in service, it is interesting to note that the art of photography has been applied to the study of this problem by H. F. Roach, president of the Reinforced Rail Joint Company, St. Louis, Mo. In this investigation, Mr. Roach has photographed locomotives and the deflections which they produce in the rail in a way which has magnified the deflections many times vertically without

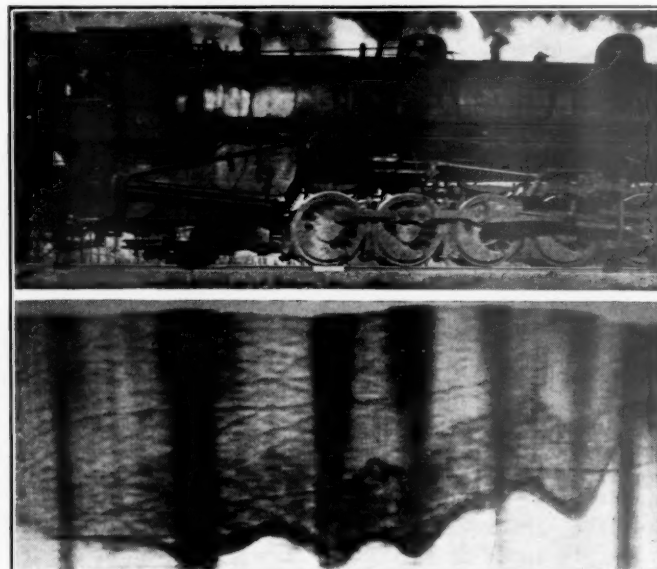


A Heavy Passenger Locomotive Moving at the Rate of 55 Miles per Hour with a Graph of Rail Deflections on a Vertical Scale 400 Times the Scale of the Photograph

distortion horizontally to enable them to be studied more intelligently.

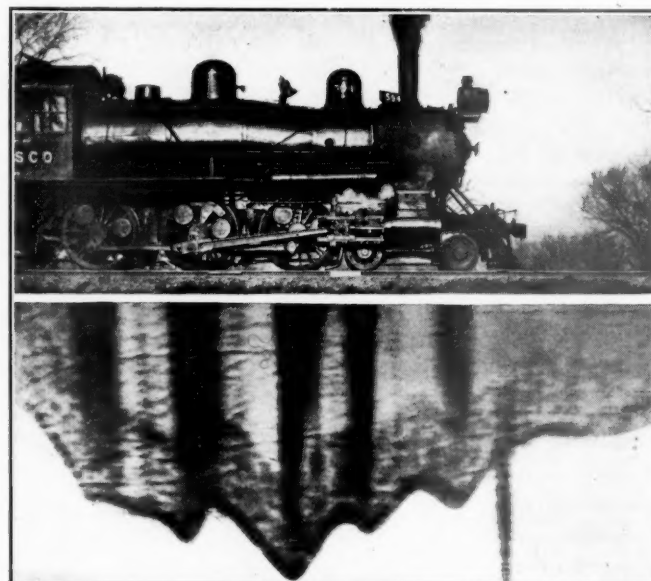
This method of photography has been applied to the study of the action of rails in the eastbound track of the St. Louis-San Francisco near South Webster, Mo., under (1) a light passenger engine starting from a stationary position, producing a maximum stress in the rail of 61,390 lb. per sq. in.; (2) a locomotive pulling a heavy passenger train at a speed of 55 miles per hour, resulting in a maximum stress of 36,810 lb. per sq. in., and (3) a heavy freight locomotive traveling at 25 miles an hour, producing a maximum stress of 33,030 lb. per sq. in. The track on which these observations were made is laid with 90 lb. A.S.C.E. rail supported on good ties imbedded in chats ballast and with good drainage. The track at the point of observation is tangent. The illustrations show the locomotives passing over the track in question and the graphs of the distortion which they produce.

In a report to F. G. Jonah, chief engineer of the St. Louis-San Francisco, Mr. Roach claims that the method of investigation makes it possible to determine (1) the rail stresses at any point for any position of load or loads; (2) the points of maximum stress; (3) the stress in rail joints at any point and for any position of load or loads; (4) the effect of the



A Heavy Freight Locomotive Traveling at 25 Miles per Hour with a Graph of Rail Deflections on a Vertical Scale 400 Times the Scale of the Photograph

counterbalance of the locomotive drivers both collectively and individually, and also whether the equalizers are properly installed so as to distribute the load over the respective drivers as intended; (5) the tie reactions, and (6) the work being done by the ballast. Attention is also directed to the fact that with a high grade moving picture camera with a



A Light Locomotive at Starting Speed with a Graph of Rail Deflections on a Vertical Scale 400 Times the Scale of the Photograph

fast lens as many as 800 pictures per second may be taken which will make it possible to take a picture of the track for every $1\frac{1}{3}$ in. of progressive movement of a train moving at a speed of 60 miles an hour, by which means the complete distortion of the rail can be shown.

Mr. Roach has applied for a patent on this development.

Boston & Maine Has 1921 Deficit of \$7,348,086

Revenue Ton-Miles Fall Off 27.8 Per Cent.—Fuel Costs
and Per Diem Also Disturbing Factors

THE SHARP FALLING OFF in traffic which took place in 1921 prevented the Boston & Maine from realizing on the drastic savings which it succeeded in making in operating expenses. Its report to the Interstate Commerce Commission for December showed a deficit after rentals of \$1,401,770; its annual report made public on Thursday of last week showed a deficit after taxes, equipment and joint facility rents and fixed charges of \$7,348,086. It is not difficult, in the light of such results as these, to understand the tenacity with which the New England carriers have carried through their fight to secure increased divisions. The deficit shown in the corporate income account—as noted above, \$7,348,086—compared with a net income available for dividends in 1920, of \$614,730. The difference as between 1921 and 1920 is explained by the fact that in the former year the road received standard return and guaranty, whereas in 1921 it had not been sufficiently restored to normalcy to be able to get its net earnings back to the pre-war basis.

However, although 1921 was an extremely poor year from the standpoint of the operating results, it was considerably better than 1920; that is, outside of the fact that in the former year there was standard return and guaranty. The actual deficit in 1920, excluding the payments from the government, was \$17,132,481. This reduction of \$9,784,395 represents the ground the Boston & Maine succeeded in covering in its efforts to overcome the disadvantages of after the war readjustment.

The Boston & Maine in 1920 came far—very far—from earning for the government its standard return for January and February and its guaranty for the following six months. In fact, in 1920, it had a deficit after rentals of nearly \$12,000,000 whereas its standard return, based on the results of the three years ended June 30, 1917, approximated \$10,000,000. In 1921 the deficit after rentals was reduced to \$1,401,770—a deficit still, but a deficit sufficiently smaller to indicate considerable improvement and to make one presume that with more normal traffic the figure of net after rentals would have been in black instead of in red.

A 27.8 Per Cent Reduction in Traffic

In view of all that has been said on the subject, it seems quite in order to remark that the Boston & Maine's primary trouble is that it is a New England road. In 1921 it had the additional difficulty that it had a comparatively small traffic to move. This, to be sure, was not a difficulty that was confined to the Boston & Maine, but the Boston & Maine experienced it in rather severe degree. The revenue ton-miles carried by the road in 1921 were 27.8 per cent less than in 1920. On the Class I railroads as a whole, the decrease in traffic was 25.2 per cent; in the Eastern district, 26.4 per cent. The Boston & Maine's traffic in 1921, measured as before in revenue ton-miles, was but slightly more than in 1914. The revenue tons were less than those carried in 1905, but the average haul was longer than in that year.

The Boston & Maine operated in 1921 at a ratio of 94.3. In 1920 the ratio was 105. The ratio of transportation expenses to revenues was 52.4 as compared with 59.3. This indicates improvement, to be sure, but roads do not make money with an operating ratio of 94.3, and especially if they are terminal carriers and their per diem debit balances are large.

"The freight business and passenger business," says the annual report, "which had reached a high record in 1920,

fell off in 1921 to an extent never before experienced in the history of the railroad as between one year and another." The revenue tons carried were 20,060,610. The ton-miles were 2,673,769,008 as compared with 3,705,528,286 in 1920, a decrease as noted above of 27.8 per cent. The freight revenues totaled in 1921, \$47,660,728 as compared with \$53,306,738 in 1920, a decrease of \$5,646,009. The passenger revenues of \$23,662,146 were \$1,058,290 less than in 1920. Total operating revenues of \$78,289,750 compared with \$86,652,745 in 1920. The operating expenses in 1921 totaled \$73,833,472 as compared with \$90,989,433. The decrease in operating revenues was \$8,362,995; in operating expenses, double that figure, or \$17,155,960.

An analysis of the savings in operating expenses brings out the familiar details which we may expect to see in most of the annual reports which will appear during the coming year, with the important exception that in the matter of fuel costs—always a bugbear for the New England carriers—the savings were not as great as might have been expected. The reductions in expenses, naturally, were primarily due to the smaller amount of business done. There were savings in the number and compensation of employees and in material costs. There were also savings in maintenance, especially in equipment. In the case of maintenance of way, more rail and ties were put in track than in 1920.

With reference to labor the details are given that the average number of employees on the payrolls was reduced from a maximum of 34,138 in September, 1920, to a minimum of 26,161 in May, 1921. Wage decreases and changes in the rules and working conditions made further savings, but reference to them is not necessary, as readers of the *Railway Age* are sufficiently familiar with this feature.

Cut in Equipment Maintenance

In the case of maintenance of equipment, the drastic cut in expenses is shown in an increasing percentage of bad order cars throughout the year, another familiar story. The Boston & Maine's bad order car situation is bad. On March 15, 1922, the percentage was 19.4 as compared with a percentage on all roads of 14.5. The same applies in the case of locomotives, the percentage of unserviceable locomotives (out of service for repairs requiring more than 24 hours) on March 1, 1922, was 27.3 which, as compared with the figure for all roads of 20.2, is rather too high to indicate favorable conditions.

Ties and rails put in track in 1921 were considerably above the totals for 1920, even though there was a decrease in expenses of maintenance of way of over \$2,000,000. The number of ties put in track was much greater than in 1920, but not in excess of the yearly average over a term of years. The tons of rail laid in 1921 totaled 24,834; in 1920, only 9,632. The yearly average for previous years would be about 20,000.

Fuel—\$7.88 Per Ton

Fuel costs rival per diem as one of the leading difficulties of the New England roads. This is plainly evidenced by the fact that in 1921, the Boston & Maine's average cost of fuel on locomotives was \$7.88 per ton. The average in 1920 was \$7.95, or in other words, the decrease was slight. A maximum of \$9.26 was reached in November, 1920, but in December, 1921, costs had dropped to \$6.82. "While the savings in the cost of fuel and other material have been substantial in certain items as compared with war period

prices," says the report, "the effect of these reductions has not been fully reflected in operating results for two causes—the first due to contracts in force before the reduction in prices obtained and the second due to the accumulation of stocks on the basis of normal volume of traffic." The actual savings in "fuel for train locomotives" amounted to \$2,720,935, the decrease being primarily due to the smaller traffic handled. However, there were evidences of economy because there were more traffic units moved per ton of coal consumed.

The debit per diem balance of the Boston & Maine in 1921, was \$3,178,427, a figure of rather staggering proportions but, nevertheless, \$1,223,496 or 27.7 per cent less than in 1920. This factor does not need extended attention as it has been the subject of considerable discussion in connection with the divisions case. However, it is worth noting that the average cars on line daily was lower in 1921 than in any year since 1908.

Passenger Cars Ordered

The Boston & Maine in 1921 had a net charge for additions and betterments of \$4,420,142, which seems a sizable amount under the conditions governing during the year. This includes new bridges at various points, extensions to the yard at Rotterdam, N. Y., and a new engine terminal at Concord, N. H. These were mostly paid for by a loan from the revolving fund administered by the Interstate Commerce Commission. The loan authorized late in 1920, amounted to \$5,443,979. There was also a loan of \$1,212,500 to assist in the purchase of new locomotives, but as a result of the falling off in traffic the purchase of this power was deferred and the I. C. C. has since approved a change whereby fewer locomotives will be purchased than originally intended and steel passenger cars will be secured instead. The placing of an order for 98 passenger train cars and 25 milk cars was noted in last week's issue of the *Railway Age*.

It is difficult to make any surmises as to what the Boston & Maine may be able to do in 1922. There can be no question but that it will be able to secure a much better net than it did in 1921. The extent of the improvement will depend very largely upon the outcome of the divisions case, the Interstate Commerce Commission's decision in which the trunk line carriers have sought to hold up by injunction. The Boston & Maine has the advantage that it has readjusted its financial structure and has put behind it the difficulties that formerly confronted it as a system made up of leased lines. The morale of the road seems to be good and there is not much doubt but that President Hustis has won for the road the good feeling of the shipping public in New England. These two assets it has to help it overcome the fact that it is a New England carrier.

Railroads Preparing New Terminal Plans at Chicago

WORK IS NOW IN PROGRESS ON two entirely new plans for complete passenger and freight terminals in Chicago for all the railroads now using the Dearborn, La Salle and Grand Central passenger stations in that city. This fact was made public on Friday, April 7, by Edward J. Noonan, engineer of the Chicago Railroad Terminal Commission, before a committee of the city council and introduces an entirely new factor in the solution of the problem of new facilities for these railroads. The roads concerned are those now occupying terminal property between the Chicago river and State street, for which no plan for rehabilitation has yet been determined upon, all the other railroads being parties to the Chicago & Northwestern, Union Station or Illinois Central Terminal ordinances which have either been carried to completion, are now in progress, or definitely arranged for.

Studies by the Chicago Railroad Terminal Commission under the direction of Mr. Noonan and the late John F. Wallace have been in progress for a long time, in the development of plans for new terminals for the railroads in question, looking toward the opening of streets and other civic improvements which would greatly encourage the city's development in the territory occupied by these railroads. The plan for the Illinois Central Terminal approved by city ordinance in 1919, also provides for the accommodation of as many of these railroads as so desire in the passenger terminal which the Illinois Central will build at Twelfth street and the lake front. The new plans now being prepared will be submitted to the city as alternatives for plans previously proposed by the city's terminal commission and the Illinois Central.

One of the new plans is being prepared by the interests owning and occupying the Dearborn station, or what is known as the Chicago & Western Indiana group. This includes the Atchison, Topeka & Santa Fe, the Wabash, the Monon, the Erie, the Chicago & Eastern Illinois, the Grand Trunk and the Chesapeake & Ohio. The plan embodies complete new facilities for these roads with an alternative plan which will also take care of the railroads using the other two stations, namely, the La Salle street and Grand Central terminals.

The other plan is being developed by the railroads of the two groups, last named. These include the New York Central, the Rock Island, and the Nickel Plate, now in the La Salle station and the Baltimore & Ohio, the Pere Marquette, the Minneapolis & Sault Ste. Marie and the Chicago Great Western now in the Grand Central station. The plan being developed for these roads contemplates a new terminal in substantially the location of the existing La Salle street station of adequate size to take care of all the railroads in the three groups.

The complete details for these new terminal development plans have not yet been made public, but enough is known to make clear that they contemplate a fulfilment of the requirements outlined by the city's terminal commission for an improvement in the street layouts throughout the territory involved. In the case of the Western Indiana project, the plan includes a development on the property in the area bounded by State street, Clark street, Sixteenth street, and Polk street. Dearborn street would be opened up as a new north and south street throughout the length of this territory and four or more east and west streets would also be opened. The entire improvement is estimated to cost about \$50,000,000.

Mr. Noonan's announcement of these plans in advance of their formal presentation to the city by these railroads was brought about in connection with a discussion of work on the Twelfth street viaduct. Sometime ago, the city commenced the construction of this viaduct, which is a monumental structure in reinforced concrete, designed to carry the street over the terminal area in question, but was compelled to suspend work for lack of funds. Recently there has been considerable agitation for the resumption of the construction but Mr. Noonan pointed out that it would be unwise to go ahead with it now owing to the fact that the viaduct as now designed is committed to the present track layout and this would interfere seriously with the radical changes which would be required in carrying out new terminal plans in this territory. It is understood that the railroads involved will be ready to submit their plans to the city within the next few months.

THE RAILWAYS OF GREAT BRITAIN paid £11,055,408 in taxes in 1921, an increase of 128 per cent over 1913, according to Modern Transport (London).



The Women's Aid of the Pennsylvania System

A "Ladies' Aid" Covering 10,000 Miles of Railroad, Business
Methods Make Friendly Neighbors

THE ABOVE TITLE is the name of an organization which now has scores of thousands of members; which mustered over 1,200 women at its annual meeting at West Philadelphia on March 30, and which has during the past year done an immense amount of social welfare work, including the expenditure of over \$25,000 in relief work in one region, the Eastern (east of Altoona and Renovo).

Using as a starting point the welfare work done by their organization for soldiers and soldiers' families during the war, the wives of the officers of the Pennsylvania Railroad have built up a permanent organization which carries out on a gigantic scale the several kinds of neighborhood work that are characteristic of ladies' aid societies of churches and local brotherhoods; and reports indicate that they are making of the work a grand success.

The constitution, the by-laws and all of the activities are planned to produce an organization which shall be thoroughly democratic in its activities and its results, though the management is entirely in the hands of wives of officers. Membership is open to the wives and daughters of all officers and employees, active or retired; to widows of employees and to women employed by the road; and the membership fee is uniformly 25 cents a year. This makes for an outward and formal uniformity. For the maintenance of actual uniformity of status and the avoidance of all offensive caste spirit, the dependence is on the skill, discretion and tact of the officers of the association and members of committees.

Large sums of money have been dispensed in aiding sick or unfortunate families of employees; but this is not charity, for the payments are from a fund which is made up mainly of dues paid by members; and the leaders keep always prominent the fact that friendliness and sympathy, not measured in money, are the main elements in their purposes. Flowers taken to a sick man in a hospital, or the activities of an experienced housekeeper or nurse in the home of the overworked or incompetent wife of a foreigner who works on the track, may constitute more important features, in the

final summing up, than would the definite expenditure of money for food, or fuel or medical attention. While many of the doings of the committee may look like the rich patronizing the poor, this appearance is not true, except to the extent that the officers' wives, with their years of experience and advantages, are, indeed, "rich" in the qualities of head and heart which make pleasant homes and the benefit of which they, as members of visiting committees, give, freely, to those less fortunate than themselves.

The annual meeting above referred to was held in the building of the Railroad Young Men's Christian Association in West Philadelphia, one of the sessions being presided over by Mrs. W. W. Atterbury, director for the entire system and the other by Mrs. Elisha Lee, associate director.* Following the afternoon meeting, brief addresses were made by President Samuel Rea, Vice-President W. W. Atterbury, Vice-President George L. Peck, Vice-President Elisha Lee and General Manager Charles S. Krick. In each region the wife of the regional vice-president of the road is an associate director, and is in charge of the work of that region. Mrs. Lee, in charge of the Eastern region, reported on March 30 a total enrollment of 49,600 members in that region; and total expenditures in relief work \$25,243. Members of local committees in that region have made calls on 11,547 families of employees; and in the cases of 2,271 families, financial and miscellaneous aid have been rendered.

The funds of the Aid are replenished not alone by the dues

*In the picture at the head of this page, Mrs. W. W. Atterbury, director, sits at the right, and Mrs. Elisha Lee, associate director, (Eastern region) at the left. The others, as numbered, are as follows, those indicated by an asterisk being members of Mrs. Atterbury's staff and the others members of Mrs. Lee's staff:

- | | |
|-------------------------|--------------------------|
| 1 Miss Constance Schell | 10 Mrs. G. LeBoutillier |
| 2 Mrs. J. A. Huntzinger | 11* Mrs. A. H. Rudd |
| 3* Mrs. W. B. McCaleb | 12 Mrs. J. D. Jones |
| 4 Mrs. J. M. Henry | 13 Mrs. I. A. Miller |
| 5* Mrs. E. B. Hunt | 14 Mrs. J. C. Johnson |
| 6 Mrs. H. M. Carson | 15 Miss E. Kathryn Krick |
| 7 Mrs. A. M. Parker | 16 Mrs. C. S. Krick |
| 8 Mrs. C. I. Leiper | 17* Mrs. Joseph V. Reaph |
| 9 Mrs. Gamble Latrobe | |

of members, but also by bazaars, candy sales, picnics, excursions, etc. On one occasion a dance was given in the Hotel Pennsylvania, New York City, at which \$3,000 was realized.

The local committees, in their relief work, are aided by and co-operate with the officers of the Employees' Voluntary Relief Department, which department is intimately related to substantially all of the employees of the road, and employs medical officers on all divisions throughout the railroad system. The Aid also co-operates in the Americanization work of this road which for several years has instructed foreign born employees in the English language and the social standards of American life.

At the various local centers, meetings are usually held once every month. The Aid is organized on precisely the same basis as the organization of the management of the road, the chief of the women's work at a given place being the wife of the highest officer at that point. Their associates are the wives of their husband's staff officers.

The constitution of the Women's Aid consists of nine sections and the by-laws of six sections. There are ten associate directors, the plan being that each one of these shall be the wife of a vice-president; but the rules allow for variation of the plan in case the wife of a given officer declines to serve. In the event of no wife of a vice-president being ready to serve, there is a provision under which a vice-president may nominate a woman connected with his department.

In each region there are associate directors and these, with the wives of subordinate officers, called general superintendents, form a regional commission in charge of the work in that region. In each region also there are lower officers called superintendents, assistant superintendents and auxiliary superintendents; and if the extent of the work makes necessary further sub-division, "supervisors" will be appointed.

The constitution may be amended, under proper regulations, by a majority vote of the board of managers.

One-eighth of the dues are applied to general expenses, and the other seven-eighths reserved for relief work.

There are on each division of the road (or each department) three committees; one on membership and visiting; one on relief and one on finance. Where necessary, because of extensive territory, sub-committees are organized. All work of committees is to be summarized in monthly reports. At the regular monthly meeting of the relief committee, reports must be made of the families visited and aided, and cases requiring discussion will be discussed, but names of persons are not to be used in these discussions. As a rule, names of persons aided are known only to the person conferring the aid and to the vice-chairman or chairman.

The finance committee must, as necessary, secure funds to replenish the treasury; and the committee must meet once a year, or oftener as may be found necessary or desirable.

Where an employee is seriously injured, or is killed, by accident, the Women's Aid is to be notified; and the doctors of the Voluntary Relief Department are to advise semi-weekly of cases of illness involving a probable absence from work for more than ten days; also notify promptly in cases of death. A visitor can expend relief to the amount of \$10 at her own discretion; but for larger expenses she must go to her general superintendent; while for expenditures of more than \$25, consultation must be had with the associate director. All information obtained by the relief committee must be treated as confidential.

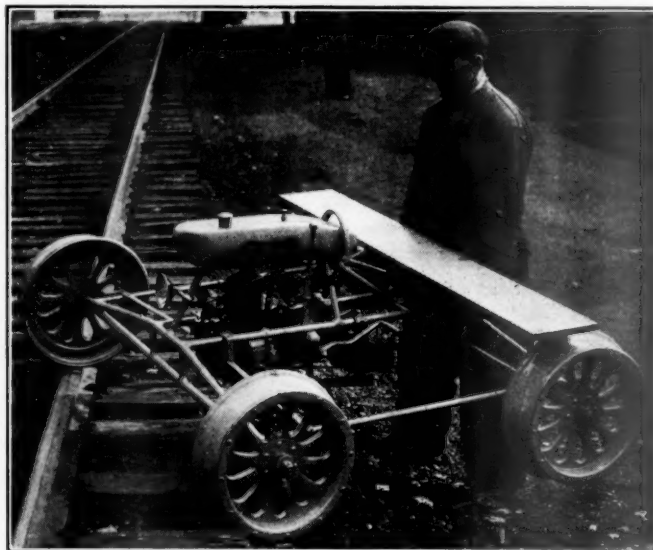
THE SPOKANE TRANSPORTATION CLUB, Spokane, Wash., has moved to larger quarters in the Title building, Sprague and Wall streets, in that city. The officers of the club, recently elected, are as follows: President, A. S. Cobb; vice-presidents, G. B. Paul, R. E. Carson; secretary-treasurer, F. J. Greene.

A New Lightweight

Railway Motor Car

A NEW LIGHTWEIGHT railway motor car has recently been put on the market which embodies a number of unusual features. The car, while only weighing about 260 lb., has a carrying capacity of five men. It is equipped with a starter, clutch control and a two-speed transmission, which, with the engine proper, form a self-contained unit that is removable as a whole by the loosening of two special bolts.

The framework of the car is made from cold drawn seamless tubing, brazed and welded at the joints over reinforcing forgings of the proper shape. The engine is of the valveless type, having a single cylinder, two-cycle motor with a 2¾-in. bore and stroke, rated at 3½ h. p. It is the standardized power unit used by the Cleveland Motorcycle Manufacturing Company, Cleveland, Ohio, in the motor cycles manufactured by that company. The transmission contains the usual spur gear arrangement, the gears, however, being in mesh constantly, the speed change being effected by the use of "dogs." The drive from the transmission is made through an alloy steel worm of generous pitch meshing with a titanium bronze worm-gear which is clutch-connected to a



One Man Can Handle the New Car Easily

large size sprocket. A large size roller chain furnishes the drive to the live axle. All bearings in the power unit are ball bearing and all wheel bearings and line axle bearings are of the roller type. The crank case and transmission and the worm-gear housing are of aluminum. All other parts of the unit which are subjected to heavy stress are made from molybdenum steel.

The clutch has 13 hardened steel discs running in oil and is controlled by a hand lever which permits of the engine being started while the car is at a standstill, or of the motor being allowed to run free. The two-speed transmission may be operated with or without the use of this clutch. A starter is included in the unit, this consists of a foot-operated lever, geared to the motor, one movement causing four revolutions of the motor. Ignition is by a direct-driven high-tension Bosch magneto. A generator furnishes current through an automatic voltage regulator for a head light and a tail light. The brake is a contracting band which is designed to work on the live axle. The railroad sales for this car are handled by Craft Incorporated, 52 Vanderbilt Avenue, New York City.

Wages of M. of W. Employees Before Labor Board

Eastern and Western Carriers Reply to Testimony of B. M. Jewell
and F. J. Warne

THE RAILROADS' ANSWER to B. M. Jewell's recent attack upon the nation's industrial system and the financial and statistical evidence presented to the Railroad Labor Board by F. J. Warne was concisely and emphatically given by J. G. Walber, representing the eastern carriers, and J. H. Higgins, representing the western carriers, to that body during the past week. Mr. Jewell's testimony was abstracted in the *Railway Age* of April 1, page 821, and Mr. Warne's testimony was abstracted in the *Railway Age* of April 8, page 884.

Regarding the "living wage" advocated by Mr. Jewell, Mr. Walber cited the history of that principle and said:

In view of the impropriety and irrelevancy of urging upon the Board consideration of the so-called "living wage" we feel that it would be improper for us to undertake to present to this Board any detailed answer to that contention. We submit that our position is sound not only because the law does not recognize the so-called "living wage" as a relevant subject for consideration here, but also because in the very nature of things the subject is intangible and based on averages that do not exist and conditions that do not prevail. It must be borne in mind that the amount of money which a family expends is not without substantial dependence upon the tastes and inclinations of the individual families, and their ability to manage the family budget. We all know of instances where families are able to live in reasonable comfort on incomes under which families are unable to pay their bills. The subject of the "living wage" and of family budgets has filled volumes and economists without number have undertaken to deal with the subject. An examination of this output of literature impresses one with the thought that no two of the treatises agree and yet each is convinced that he has a 100 per cent solution of the whole problem.

The budget information submitted by Mr. Jewell was also discussed at length by Mr. Walber, who pointed out numerous fallacies in the facts and figures presented by the former. "It must be evident that the board cannot accept these budgets as being representative or typical," Mr. Walber said.

Referring to other phases of Mr. Jewell's lengthy presentation, Mr. Walber said:

There is no need to discuss the soundness or fallacy of the conclusions reached in these sections of the presentation because they are obviously irrelevant to the issue now before the Board and, at most, present sociological problems not only beyond the power of the Board to consider and decide but as well not even concerning the transportation industry. Notwithstanding this fact, however, we think it will be interesting to the Board if we point out a few instances wherein these conclusions are erroneous, misleading, unfair and entirely irrelevant when applied to the railroad situation, which is the only subject that the Board may at this time consider.

There followed a brief analysis of several other phases of Mr. Jewell's testimony, ending in an analysis of the comparative purchasing power of the wages received by members of the Federated Shop Crafts in different years. Tables presented by Mr. Walber, making allowance for the reduced purchasing power of the dollar, showed that machinists, electricians, sheet metal workers, boiler makers, blacksmiths and moulders are able to purchase 47 per cent more of the necessities of life with their wages at the present time than they were in 1914, while carmen are able to purchase 81 per cent more than they were in 1914. Mr. Walber, in addition, showed that, measured in actual purchasing power, the return upon investment of the eastern railroads for the year 1921 was but 1.84 per cent instead of 3.01 per cent. "If it is right to convert the wages into the equivalent in purchasing power," Mr. Walber said, "certainly as far as the individual stockholders are concerned it is proper to convert the returns of the railroads on the same basis."

In closing his analysis of Mr. Jewell's testimony, Mr. Walber said:

We definitely disclaim any purpose to answer the statements, figures, theories and conclusions contained in Mr. Jewell's presentation. The few to which we have in passing made any reference whatever are those only in which it seemed to us there might at least be some interest although not the slightest relevancy. If time permitted and useful result might thereby be served, we could point out instance after instance of half-truths, distorted figures and illogical conclusions.

The presentation shows that it opens with certain questions and ends with certain questions without any answers in either place. The only possible conclusion that we can draw is that it is an advocacy of communistic doctrines. It is well known that there have been various experiments of this kind on a small scale and at different times in different portions of this country, and they have in every case dismally failed. Our faith in this country makes us believe that it will never be misled into such a pitfall.

J. G. Walber Points Out Inconsistencies

in Warne's Position

In taking up the testimony of Mr. Warne, Mr. Walber pointed out the inconsistencies in the employees' position in submitting the wages being paid by the steel and coal industry, for instance, in support of wage increases and then denying that the wages paid to employees in these industries should be considered in connection with wage decreases as was contended by Mr. Warne. He pointed out in addition, that Mr. Warne's testimony on the holdings of railway officers in other industries, which the latter contended should eliminate these industries as factors in the determination of wage scales because of "control," was of no value because Mr. Warne did not state the amount of the holdings of the individuals he named and furthermore, because many of the men named are not living at the present time. As an illustration, Mr. Walber cited the fact that of the 15 directors of the New York, New Haven & Hartford, cited by Mr. Warne, only two are still directors, two died in office in 1913 and the others' terms expired in 1913 or 1914, and they have not been in office since then.

Referring to the financial testimony produced by Mr. Warne, Mr. Walber said:

It seems that no presentation of a dispute regarding either rates or wages is quite complete in the minds of the representatives of the employees without reference to alleged improper financial transactions of one kind or another on the part of the railroads in the remote past, notwithstanding the remedial legislation that has been passed by both Congress and the states within the past few years, making such alleged improper financial transactions impossible today. We submit that it is an unfair and unjust assault upon the railroad industry as a whole and can serve no possible useful purpose in a hearing of this kind other than to excite the prejudice of the Board and the public against the industry hoping that in this artful way they may draw into the case for consideration, a matter which is wholly irrelevant and unimportant.

Graded Rates for Mechanics Defended

The application of the railroads for the right to establish varying rates of pay for mechanics' work based upon the skill and training required, was attacked by the employees and termed impossible. Taking up this phase of the controversy, Mr. Walber defended the railroads' request on the ground that this practice was in effect more or less throughout the country prior to federal control, that it is now being done in other industries and that therefore there is no reason why it cannot be established on the railroads.

In closing his presentation Mr. Walber said in part:

The Board certainly realizes that the discussion during the progress of this case wandered far afield. We believe that the opening statement which we made on behalf of the Eastern railroads clearly and briefly outlines the matters involved in the present controversy and the basis upon which the Eastern railroads feel that they are justified in asking their employees to accept reductions in wages. This statement was made March 9 and it may not be amiss to recall to the minds of the members of the Board that the basis of the contentions of the Eastern railroads was set forth as follows:

The Transportation Act enumerates seven specific criteria to be considered by the Board, etc.; that the Board has interpreted "other relevant circumstances" in Decision No. 2; that it must be obvious that these circumstances are of paramount importance; that the prosperity of the railroad workers is interwoven with and dependent upon the success of the railroad business itself; that so long as wages must be maintained at a wartime level the railroads will be prevented from adjusting their conditions to a peace-time basis; that if the income of the railroads is to be absorbed by such wartime scales of pay it necessarily follows that corresponding reductions must be made in the working forces; that it is to the greater interest of the railroad employees and the public in general that the employees be placed upon a basis which will permit of working the maximum forces, so producing employment for the greater members, increasing the consuming public and in that way contributing to the general revival of business; that it was not only because of the compelling necessity for reductions in labor cost that the carriers proposed to their employees reductions in wages, but also because the carriers are convinced that the new scales of pay which they propose are just and reasonable in the light of the specific elements enumerated for the determination of wages. The Board will recall that we then proceeded with an analysis of wages in outside industries and with changes in the cost of living and supported our contentions in those directions with exhibits relevant thereto. We did not introduce exhibits on the "Hazards of Employments"; "Training and Skill Required"; "Degree of Responsibility," as we considered that there had been no material changes in these respects since the previous decision of the Labor Board.

J. H. Higgins, representing the western carriers, also replied to the contentions of the employees, stating in reference to Mr. Jewell's attack upon the industrial system:

We all agree that workers should have a fair and even liberal share of the profits of industry. We understand that the workers of this country obtain a greater share of such profits than do the workers of any other country. The workers' profits are expressed in wages, which is the most practicable way of giving to the worker the variety of products he requires for his own needs. Mr. Jewell did not explain how the workers will get their share under his dictum. He did not show you where he would find those willing to operate at a loss to themselves in order to give others profits in the form of wages.

J. H. Higgins Attacks Warne's Testimony

The charge that the railroads precipitated the present coal strike is absurd and unsupported, according to Mr. Higgins. Mr. Warne had said, "The railroad companies, in conjunction with the steel companies . . . are forcing 500,000 coal mine workers to go out on strike."

Mr. Higgins, replying to this charge, said:

Without offering a scintilla of supporting evidence, Mr. Warne has brazenly charged the railroads with precipitating a nationwide coal strike. The thing is so absurd that even a poorly developed sense of the ludicrous would have made such a statement impossible. With as much truth he might have outlined holdings of railroad officers in ballast pits and for tie timber and then charged that such holdings control the stone, gravel, sand and lumber business of the country.

Speaking of the employees' evidence in general, Mr. Higgins said:

Their presentation seems to wholly satisfy their minds and they aim to convince the Board that directors and managers of corporations are unworthy of confidence. No evidence is submitted by them outside of the fact that those men are the responsible trustees of the property and guardians of the corporate interests of hundreds of thousands of other owners. Without an iota of supporting evidence, they pillory these directors and managers as men with a predilection for conspiracy—even the small holder of a share of stock or a bond of other industry, if he happens to be a railroad man, falls under their suspicion.

Mr. Higgins closed his remarks with the request that the Board refuse to take into consideration any evidence pre-

sented by the employees bearing upon the railroad situation prior to July 1, 1921, when "after a hearing and consideration of all factors, the board fixed fair and reasonable wages in accordance with the law."

Carriers Ask for Lower Wages for M. of W. Employees

The wide difference between the rates of pay of unskilled labor on western railroads and common labor employed by other industries in the same territory was cited by Mr. Higgins on April 10, in support of the carriers' plea for lower wages for railway maintenance of way department employees. In presenting the results of a survey of wage and employment conditions made by railroad officers, Mr. Higgins said:

Of the total of 318,893 employees of all classes studied in other industries in 28 Western states in December, 1921, 121,866 or 38 per cent were performing work analogous to that performed by railroad employees in the maintenance of way departments. Of these 121,866 employees, 87,113 or 72 per cent are getting lower wages than are paid by Western carriers for like service. Furthermore, of the 121,866 workers, 111,939 or 92 per cent are laborers performing work similar to that performed by the unskilled laborer in the maintenance of way department, and 82,153 or 74 per cent of these men are receiving less than the railroads pay for like services.

Even in the large cities where it is generally understood the industrial rates of pay more nearly approximate the railroad rates we find similar conditions. This is shown by the studies made in 26 principal cities of 125,425 workers, 98,814 or 79 per cent of whom are being paid lower wages than are paid by the railroads for analogous work. Of this 125,425 employees 33,903 or 27 per cent are doing work similar to that being done by railroad employees in the maintenance of way departments. Approximately 73 per cent of these men, or 24,822 employees are receiving less than the railroad rate for like services. In addition, of these 33,903 employees, 29,211 or 86 per cent are unskilled laborers performing work comparable to that performed by the common laborer on the railroads, and 21,570 or 74 per cent of them are receiving lower wages than are paid on the carriers.

It is largely because of this disparity between the wages paid by the railroads and the wages in effect in other industries for employees performing comparable services that the western roads are asking the Labor Board to authorize: (1) a decrease of five cents in the hourly rate of bridge building and painter foremen, assistant foremen, track and maintenance foremen, assistants and mechanics; (2) a decrease of seven and one-half cents in the hourly rate of mechanics' helpers in the maintenance of way departments; and (3) the railroads to pay unskilled laborers the prevailing rates in the territory in which they are employed.

After calling attention to the fact that the present railroad rate for unskilled labor is from 139 to 153 per cent above the 1915 rates and 80 per cent above the 1917 rates, Mr. Higgins added that "this confirms our position that railroad rates are entirely out of line when considered in connection with the rates of pay in outside industries and the other relevant circumstances named in the law for determining just and reasonable wages."

In discussing the principle of the "living wage" which has been advocated by representatives of the employees, Mr. Higgins said:

The railroads are in full accord with the principles that all workers have a right to a "living wage" and that "minimum rates of pay should be established which will insure the subsistence of the worker and his family in health and reasonable comfort." They believe that this Board can and should fix a minimum wage commensurate with the living requirements in the different sections of the country, giving heed to the difference as between large cities, smaller cities and rural communities and likewise to the climatic, geographical and other conditions which have a direct influence on living costs.

Mr. Higgins also called attention to the advantages enjoyed by certain employees in the maintenance of way departments of the railroads such as company houses at nominal rent, bunk cars for extra gangs, economical subsistence in railroad labor camps, opportunity to buy produce direct from farmers along the line, etc., and asked that these factors be taken into consideration in fixing new rates.

J. H. Higgins Asks for Latitude to Meet Local Conditions

The efforts of the railroads in the present wage controversy are directed toward a return to the long-established and recognized practices of pre-war times when the managements had sufficient latitude to meet local wage and employment conditions in the different sections of the country, Mr. Higgins contended in closing the testimony of the western roads on the wages of maintenance of way employees. He said in part:

It is a well known fact that the rates for common labor are always the first to go up, and that these rates in industries were increased in much greater proportion than those of most of the classes during the war period. In many cases the increase was over 200 per cent, and in comparatively few cases did it increase less than 100 per cent.

While we want wage rates for such employees to be fair and adequate, we hold that under the provisions of paragraph (d), Section 307 of the Transportation Act, Congress did not intend by those provisions that a flat rate should prevail throughout the entire country. On the contrary, by requiring that the wages for railroad employees should be considered and related to wages paid similar work in other industries, Congress undoubtedly intended that comparison should be made with the rates paid in such industries in localities contiguous to each road. Therefore, the comparison should be with natural rates in other industries in the various sections of the country, and not with an artificial flat rate.

After outlining the manner in which "rigid" rates for unskilled labor came to be applied on the railroads during the war and the effect of these conditions, Mr. Higgins continued:

It has been impossible to make agreements with the men to fit local conditions and hence our appeal to this Board for relief from the high rates and anomalous situation thus created. We think the Board should not persist in retaining this disability. As the situation stands the railroads, being obliged to pay higher rates than paid in outside industries for this unskilled work, are under a great financial disability that also subjects them to criticism from the public, not only as shippers, but as employers of labor.

J. G. Walber Shows Difference Between Railroad and Industrial Wages

If the reduction asked by the eastern roads in the rates of pay of railroad maintenance of way employees were to be granted the wages of these men would still be higher than the wages of men doing comparable work in other industries. This fact was brought to the attention of the Board on April 10 by Mr. Walber, representing the eastern carriers. A mass of wage data was briefly summarized by Mr. Walber and is partly contained in the following table:

RATES OF PAY IN CENTS PER HOUR

	Rate in Outside Industries	Present R. R. Rate	Rate Proposed by R. R.	Rate Proposed by Men
Foremen	66.9	75.9	70.9	85.9
Carpenters	54.3	61.6	56.6	71.6
Iron Workers	59.1	74.2	69.2	84.2
Painters	47.3	62.1	57.1	72.1
Masons, Bricklayers, Plumbers, etc..	66.5	67.5	62.5	77.5

In addition, Mr. Walber showed that:

Of 705 employees in outside industries who are comparable with these foremen, only 317 (45 per cent) received rates equalling or exceeding the present prevailing rate on the railroads and only 361 (51 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal. Fifty-eight (eight per cent) were receiving rates equal to or in excess of the average requested by the employees.

Of 2,016 employees in outside industries who are performing work comparable with that of carpenters, 461 (23 per cent) received rates equalling or exceeding the present prevailing rate on the railroads; 764 (38 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal; 262 (13 per cent) were receiving rates equal to or in excess of the average requested by the employees.

Of 300 employees in outside industries who are comparable with bridge and building iron workers, 85 (28 per cent) received rates equalling or exceeding the present prevailing rates on the

railroads; 85 (28 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal; 55 (18 per cent) were receiving rates equal to or in excess of the average requested by the employees.

Of 493 employees in outside industries who are comparable with bridge and building painters, 20 (4 per cent) received rates equalling or exceeding the present prevailing rates on the railroads; 86 (17 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal; two (four-tenths of one per cent) were receiving rates equal to or in excess of the average requested by the employees.

Of 1,190 employees in outside industries who are comparable with other skilled maintenance of way employees, 366 (31 per cent) received rates equalling or exceeding the present prevailing rates on the railroads; 531 (45 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal; 293 (25 per cent) were receiving rates equal to or in excess of the average requested by the employees.

Regarding unskilled labor, Mr. Walber showed that whereas these employees were receiving from the railroads a weighted average hourly rate of 39 cents per hour, the average hourly rate of 91,734 employees in other industries performing work comparable to that performed by common laborers on the railroads is but 33 cents. Of these 91,734 workers, 36,865 were receiving 30 cents an hour, 25,856 were receiving 33 cents an hour, and 29,013 were receiving 37 cents an hour, Mr. Walber said.

During the war the Eastern territory was particularly affected by competition for labor. The result was that to a very large extent the former differentials in the rates between cities and rural points, large terminals and way points were practically eliminated.

An examination of the disputes from the railroads shows that each railroad proposes adjustments to meet conditions peculiar to it. It is of course recognized that unless the Board were to render a separate decision upon each dispute, each proposal could not be met, but based upon the disputes, it is evident that the intent running through all of them, is to be placed in position to apply certain rates to main line operations, differentials thereunder for branch lines, where the work is less responsible, with differentials above the main line rates for labor engaged in engine terminals, etc. To work this out it would appear that, considering that practical standardization exists today, a decision permitting graded reductions to apply to the different services indicated would meet the problem.

Of 36,865 employees in outside industries who are comparable with common laborers in the shops and roundhouses, only 575 (two per cent) received rates equalling or exceeding the present prevailing rate on the railroads; only 10,535 (29 per cent) received rates equalling or exceeding rates which would obtain under the railroads' proposal, (preponderating rate 32 cents) while only four were receiving rates equal to or in excess of the average rate requested by the employees.

Of 25,856 employees in outside industries comparable with laborers in the maintenance of way department, approximately 12,400, or about 48 per cent, were receiving rates equal to or below the rate proposed of 32 cents. Approximately 22,500, or 87 per cent, were receiving rates below the present average wage of 39.8 cents. Only 44 were receiving rates equal to or in excess of the average rate requested by the employees.

Of course the Board understands that labor in other industries does not do precisely the same kinds of work that track labor performs, but it must be admitted that in the large manufacturing centers common labor freely shifts between the railroads and the industries, but it is all of the same general character and such common labor in the industry affords the most direct comparison that it is possible to make.

F. P. Walsh Directs Defense of Present Wage Scales of M. of W. Employees

Representatives of the maintenance of way employees began the defense of their present wage scales before the board on April 11, Frank P. Walsh, W. J. Lauck and Arthur Sturgis testifying. Mr. Walsh's opening remarks were confined to pointing out the inability of maintenance of way employees, particularly section men and other unskilled labor, to live on a wage of \$70 a month or \$840 a year, which he said these men were now receiving.

Mr. Lauck dwelt at length on the effect of "unduly low wages on infant mortality." "Further reductions in the already pitifully low wages of these men," he said, "will mean

the death of thousands of children through malnutrition or through the enfeebleness of the mother."

Lowering wages, he contended, is not a statistical, economical or industrial problem but rather a problem of public policy, morals, ethics and of humanity itself.

A request was made by Mr. Lauck that the Board summon a list of expert witnesses "to demonstrate conclusively that it would be equivalent to depriving laborers and their families of the very means of existence, that it would be violative of public and private morals and contrary to all considerations of a sound and enlightened public policy, for the Board now even to consider any reduction in the rates of pay of unskilled labor." In addition he stated that by these witnesses he would attempt to "prove that if the Board should reduce wages of section men and unskilled labor, it would impair the efficiency of the railroad, it would be directly contrary to enlightened public policy, it would result in the physical and moral deterioration of these employees and their families and in the malnutrition and actual death of their children."

The Board later ruled that it would not grant this request immediately but would again consider it when all of the evidence now available has been presented.

In closing his remarks, Mr. Lauck contended that there is a "stopping place" below which wages cannot go. "We claim it has already been reached in the case of unskilled and low paid workers," he said, "and therefore, all the testimony and exhibits presented by the railroads and bearing on their wages are here irrelevant and valueless."

Mr. Sturgis' testimony opened with the statement that, "justice to the workers would demand an immediate increase in wages but a wage tribunal must keep at least one foot firm on the ground and in my opinion this is no time for a wage increase even if leaving wages as they are now results in hardship and sacrifices on the part of the railroad workers."

He also discussed the "so-called law of supply and demand" which he contended was not now a law in the determination of just and reasonable wages and should not be considered in this case through the admittance of testimony presented by the carriers and showing the disparity between the rates of pay on the railroads and the rates of pay prevailing for analogous work in other industries, the employees of which, Mr. Sturgis contended, were subject more or less to the workings of supply and demand.

The witnesses asked for by Mr. Lauck include:

Prof. William F. Ogburn, Columbia University, New York; Dr. B. S. Warren, assistant surgeon general, U. S. Public Health Service, Washington; Edgar Sydenstricker, chief statistician, U. S. Public Health Service, Washington; William E. Mosher, director of the New York Bureau of Municipal Research, New York, and Ethelbert Stewart, commissioner of labor statistics, Department of Labor, Washington.

A. F. of L. Leaders Denounce Labor

Board and Transportation Act

With Samuel Gompers, president of the American Federation of Labor, and B. M. Jewell, head of the Railway Employees' Department of the federation, on the firing line, the Labor Board and the Transportation Act were targets of a double barreled attack at the opening session of the railway department's sixth biennial convention at Chicago. More than 500 delegates, representing 750,000 workers in the six railway shop crafts and the clerks' and switchmen's unions are attending the convention which probably will last two weeks.

Mr. Gompers assailed the Transportation Act as "injurious and a failure" and implied that railroads get the "break" in decisions of the Board. Mr. Jewell's remarks were even more pointed. He denounced the Transportation Act as the

"most vicious piece of legislation ever foisted upon the people," adding that the next two years will tell whether employees will continue to abide by decisions of the Board.

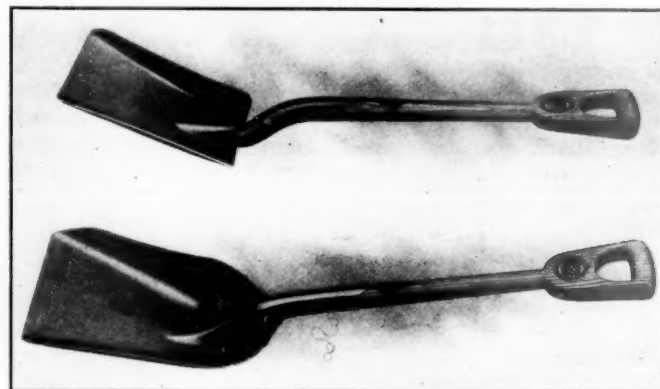
"The attention of the workers of this continent are fixed on your deliberations here," said Mr. Gompers, "for out of them will come certain settled policies which make for the good of men and women in your industries. It is essential that you know your cause well, depend on it strongly, and be willing to do and dare the right thing for the working masses of the country. There has come a time when men must show they have teeth and can bite."

F. P. Walsh's Human Exhibits

On April 12 Mr. Walsh began the presentation of a series of human exhibits to prove his contention that it is impossible to live decently on present wages. A number of section men and section foremen and their wives testified as to their living costs during the past year. Several of the witnesses presenting detailed figures on their expenditure. The majority of these witnesses stated that since the wage cut of last July they have been forced to go into debt for food, clothing, et cetera, and stated their belief that it is impossible for them to maintain their present standard of living and educate their children on the present or reduced wage scale.

Molybdenum Steel in Shovel Construction

A MOLYBDENUM steel scoop for firing locomotives and stationary boilers has been placed on the market by the Wood Shovel & Tool Company, Piqua, Ohio. The blade of the scoop is made of molybdenum steel, especially treated to give great hardness combined with remarkable toughness. The greater strength of molybdenum steel permits lighter construction with its resultant saving of energy for the worker. A feature of the new scoop is the welding of the straps to the blade, making the two parts virtually one. The bolts are countersunk into the handle which is of



Track Shovel and Fireman's Scoop Made of Molybdenum Steel

seasoned second-growth northern ash. The rigidity of this construction assures long life in actual service.

The molybdenum shovel is made in different types, one being designed for track maintenance and similar work. In designing the track shovel, the manufacturers recognized the fact that it is frequently used in place of a sledge or a crowbar in addition to its normal function, hence, a shovel was constructed to stand up under the gruelling strain and abuse of track maintenance service. Shovels made of the new alloy have been subjected to rigid tests by the Wood Shovel & Tool Company and have demonstrated the value of molybdenum steel for shovel construction.

Julius Kruttschnitt Before Senate Committee

Testimony Offered in Rebuttal of Statements Made by Former Directors General McAdoo and Hines

WASHINGTON, D. C.

JULIUS KRUTTSCHNITT, chairman of the Southern Pacific, testified before the Senate Committee on Interstate Commerce on April 12 in reply to statements by Mr. McAdoo and Walker D. Hines. Mr. Kruttschnitt told the committee that the charges made before the committee by Mr. McAdoo to the effect that federal control was necessary because the railroads "broke down" in 1917 contradicted statements made previously not only by Mr. McAdoo but by President Wilson, the Interstate Commerce Commission and others. Mr. Kruttschnitt said that Mr. McAdoo's charges were made after "Mr. McAdoo's failure to make good his prophecies as to the results of his operation of the railroads."

The McAdoo of 1918 and of 1922

"The authorities we cite," Mr. Kruttschnitt said, "prove that the McAdoo of January and February, 1918, rightly gave the reasons for taking over the railroads. It follows inevitably that the McAdoo of February, 1922, was inconsistent and wrong and that the changed dates and decisions make it clear that little weight should be attached to his testimony before you in 1922. Although in January and February, 1918, Mr. McAdoo gave the true reasons why the government found it necessary to take over the roads, in February, 1922, he asks you to believe it was because the railroads were broken down physically to such an extent and so inoperative as to be 'the strongest ally of the German Kaiser.'"

Mr. Kruttschnitt said that "two bad features stand out prominently in the government management of railroads which were responsible for most of its shortcomings and subjected it to most criticism. They were extreme centralization of authority, established by the first director general and attributable to his temperament and unwillingness to delegate adequate and necessary power to his local officers, and excessive and unintelligent standardization.

Lack of Discipline

"To the first must be attributed the destruction of morale and discipline. The teaching of labor to ignore and condemn their officers, to look to Washington to save them from punishment for neglect of duty and breaches of discipline, for increases of pay and indirect increases, for services never performed, double pay for the same hours of service, all of which produced poor service and indifference to the public. The 'public be damned' policy, unjustly and improperly accredited to private railroad management, was inaugurated and worked to such an undreamed of degree that at the end of the war the return of the railroads to private management was demanded, by those who used them, with substantial unanimity.

"After 26 months of mismanagement the government surrendered the roads with a heritage of \$1,800,000,000 of debt, according to Senator Cummins, saddled on the country, conveniently alleged to represent a legitimate war cost, although much of it was inexcusable, avoidable waste, a scale of government-control operating expenses that ran up to over \$3,000,000,000 more than in 1917 before it could be checked and so burdensome as to make it cost almost 100 cents to earn each dollar of gross revenue."

Mr. Kruttschnitt said that the President in taking over control of the railroads had given assurance to security holders that their rights and interests would be as scrupulously looked after as they would be by the directors of the several railway systems and that there would be as little dis-

turbance of the operating organization and personnel of the railroads as possible.

"These promises and the guarantees of Congress that the roads should be maintained in as good repair and in as complete equipment as when taken over, were completely ignored," said Mr. Kruttschnitt. "The percentage of operating expenses to earnings was raised from 70.48 to 93.47 per cent, the renewals of rails, ties and ballast, was skimmed to the danger point; and the equipment, scattered all over the United States, had been given scant attention and was in the worst condition ever known. At the beginning of federal control 128,780 freight cars were reported in bad order and at the end of federal control 153,727 cars were in bad order, an increase of 24,947 cars. This increase alone would fill a track 192 miles long, but Mr. McAdoo did not disclose the real situation as to the physical condition of freight cars at the end of federal control.

Savings Due to Less Service

"Mr. McAdoo summarizes alleged savings by him of \$118,000,000 in 1918 over 1917. These are substantially the same figures analyzed by us before your committee when we showed that out of the total savings \$79,665,000 represents the cost of suppressed passenger train mileage, service of which the public was deprived during government control and which from patriotic motives they endured patiently. The total amount claimed to have been saved outside of the cost of suppressed passenger service, \$19,193,000, is sixty-five one-hundredths of one per cent only of the total operating expenses. The director general informed your committee in April, 1919, that monthly payrolls of central and regional administrations amounted to \$513,000 in December, 1918, or at the rate of \$6,390,000 per annum; that in addition, office and traveling expenses for the year amounted to \$778,625; grand total at close of 1918, \$7,168,000 per annum or \$1.17 for every dollar saved in salaries of corporate officers.

"Mr. McAdoo out-Hines Mr. Hines in claiming that the railroads were in very bad condition before federal control; that the Railroad Administration increased efficiency, and that the heavy traffic moved in 1920 was due directly to the good conditions in which the properties were turned back," said Mr. Kruttschnitt. "Private operation neither failed nor broke down in 1917 and with the plant provided by railroad owners it gave service that had never been equalled in railroad history."

Praise from the Executive

Calling attention to the statement made by the President in his message to Congress on January 4, 1918, explaining why he took over the railroads, as well as statements of the Secretary of War, the Quartermaster General, and the National Association of Railway Commissioners regarding the accomplishments of the railroads in 1917, Mr. Kruttschnitt added:

"If all of those unbiased gentlemen including the Commander in Chief of the Army and Navy, commend the loyal and co-operative service of the railroads, all of them according to Mr. McAdoo must be aligned with the strongest allies of the German Kaiser."

Asked as to his opinion of the plan proposed by the Association of Railroad Security Holders relative to the pooling of equipment, Mr. Kruttschnitt said that the plan "seems to be full of glittering generalities," but that he had recommended the appointment of a committee to study it.

European Experience with Cab Signals

THE USE OF AUDIBLE cab-signals in Europe, reviewed by L. Weissenbruch in 1920 (*Railway Age*, July 2, 1920, page 29) is the subject of two papers that have been prepared for the International Railway Congress being held this month at Rome, which bring the history of this subject down to date.

The first of these two papers is by Ferdinand Maison, an officer of the railway department of the French Government, bringing the subject down to the beginning of the war, in 1914; and the second is by Jules Verdeyen, inspector of management of the Belgian State Railways (apparently the successor of the late Louis Weissenbruch). The first paper is printed in the Bulletin of the International Railway Association for November, 1921, and the other in the Bulletin for March, 1922. The first one fills about 90 pages, and discusses at length all proposals for assisting engineers in the observing of signals; describes the devices of the principal inventors and has a chapter on speed recording indicators, four of which are described.

The "crocodile," of Lartigue, the well-known cab signal in use on the Northern Railway of France, was put in use on all of the double-track lines of that company as far back as 1880. In September, 1891, Ribard's automatic stop apparatus was tried in France, following the disaster of St. Mandé, when 46 persons were killed. In 1898 another disaster aroused the public, and the Minister of Public Works of France issued a circular to the railroads calling upon them to develop some preventive of collisions. Two years later another circular was issued, and the subject was discussed again at the International Railway Congress in Paris in 1900; but actual progress was slow and halting, for reasons apparently quite similar to those which have prevailed in America. Numerous trials were made in France in 1901 and 1902, a dozen devices being mentioned, but there were no permanent results of much consequence. About 1907 the Eastern Railway of France and the Paris, Lyons & Mediterranean began trying the "crocodile" or something similar to it.

Finally, in November, 1913, occurred the disastrous collision at Melun; and the reflections of the reviewer at that time indicate that all of the efforts of the government had amounted to little. "With the exception of the Northern Railway, the managements have not thrown into the investigation of this problem all the energy and ingenuity which they have displayed in the study of other problems which appeared to them to be of higher interest."

Following this introduction, Mr. Maison occupies 40 pages with descriptions of the various appliances that have been tried; and then there are 20 pages of theory and 10 pages describing speed recorders. On January 1, 1914, the number of locomotives equipped with speed recorders in France was 10,894, of which about four-fifths were passenger engines. All of the six principal companies had locomotives thus fitted, the State Railways having the largest number. Four-fifths of all engines on all roads were equipped. The Flaman apparatus, noted in the *Railway Age* of May 7, 1920, page 1351, appears to be the one most generally used, being found on all of the roads except the Southern and the Orleans.

Mr. Verdeyen begins with a brief review of the few advances made during the war. The circular issued by the French government in 1919 called upon the railroads to make, without delay, a definite selection from the various appliances that had been tried; and, in the meantime, to make more general use of torpedoes, to be placed on the rails behind halted trains, the same as is done in America. Since 1920 the Eastern, the Orleans, the State and the P. L. M. have decided to adopt the crocodile as used on the Northern Railway, with minor modifications. The crocodile has been

improved by an arrangement for keeping its surface coated with paraffin or oil which makes it easy for the brush to clear the surface of frost or snow.

The State railways abandoned the various contact devices which had been under trial since 1911 and adopted the Augereau wireless apparatus which was described in the *Railway Age* of May 7, 1920. The extent to which this apparatus was installed is not stated; although it is said that the experiments on the line between Paris and Chartres included 40 signals. In a subsequent paragraph Mr. Verdeyen says that the Augereau apparatus has been abandoned and that the crocodile of the Northern Railway has taken its place; this with a view to securing uniformity.

The Southern Railway, acting on the suggestion of the government in 1919, that torpedoes should be more generally used, installed a torpedo machine, set at the side of the road, made apparently on the same general principle as that which has been brought out in this country by the Federal Signal Company, as recently noted in the *Railway Age* (March 4, page 517). Mr. Verdeyen seems to think that if the good results thus far shown are confirmed by longer trial, the Southern Railway will be in favor of adopting this machine instead of using cab signals.

Mr. Verdeyen, in his summing up, referring to the favorable opinion entertained by the Southern Railway concerning roadside audible apparatus, says that experiments with apparatus of this kind in Belgium, extending over two years had produced less favorable results; there had been a considerable number of failures of torpedoes and there was trouble because of the premature exhaustion of the store of torpedoes.

The Northern Railway now has cab signals on all of its road locomotives; and the number of fixed contacts on the roadway is 3,800 on a length of 2,360 miles of track. The Eastern, the State and the P. L. M. are making good progress in extending installations. The Northern and the Eastern railways both have added to the cab signal an audible warning, different from the cautionary warning, to sound when the signal is at clear.

Mr. Verdeyen finds that in 1920 the total number of locomotives in France fitted with speed recording apparatus was 12,655. Supplementing the descriptions of speed recorders given by Mr. Maison, this paper contains a brief description of the Deuta apparatus which is in use on the railways of Alsace-Lorraine. Of these and other designs of recorders, the railroads of Alsace-Lorraine have 1,018 in use.



Photo by International

Loud Speaking Radio Phone on Cornell University Special, D. L. & W.

Automatic Train Control Hearing Is Resumed

I. C. C. Hears Train Control Companies Present Facts Pertaining to Their Systems

IN ORDER that automatic train control companies could present evidence in connection with the proposed order of the Interstate Commerce Commission on automatic train control, the Commission at the close of the testimony of the railroads on March 24 (reported on page 837 of the *Railway Age* for April 1) continued the hearing until April 12.

Before the train control companies were called on, M. C. List, attorney for the Commission, presented for the record a list of acts and documents pertaining to train control showing the government's activity on this subject. Mr. List outlined the reasons which led up to the formation of the Block Signal and Train Control Board in 1907; the amount appropriated and spent by the government in its investigations through the Board and later by the Bureau of Safety. Extracts pertaining to automatic train control were read into the record from the reports of the Board and from the Bureau of Safety's annual reports after the Board was discontinued.

Performance and Accident Records

The Bureau of Safety prepared and submitted through Mr. List a tabulation of the operating records of the American Automatic Train Control Corporation, the Miller Train Control Corporation and the Regan Safety Devices Company which were based upon the reports of the engineer-examiners and the inspectors of the Joint Committee on Automatic Train Control of the American Railway Association. These tabulations cover the same period as that portion of the report of the subcommittee of the Joint Committee (of the A. R. A.) which relates to the devices in use which was presented by J. A. Peabody at the hearing on March 20, and in connection with the tabulation prepared by the Bureau of Safety a careful check of the Joint Committee's compilation was made. Differences in the classification and record of failures and undesirable stops were shown in the statement accompanying the memorandum.

A summary of the accidents which have occurred between 1906 and 1921 inclusive shows a total of 106,473 which resulted in 6,142 killed, 95,936 injured and a loss of \$80,386,694. There were 17,042 rear end collisions resulting in 1,914 being killed, 25,974 injured and a loss of \$21,507,894. During this period the number of head end collisions were 9,255 in which 2,412 were killed and 34,708 were injured. This resulted in a loss of \$19,461,769.

Collisions investigated by the Commission from July 1, 1911, to March 31, 1922, were as follows:

Kind of Collision	Number	Persons	
		Killed	Injured
Head end	255	863	5,462
Rear end	205	773	3,948
Side	43	130	738
Miscellaneous	15	41	139
Totals	518	1,807	10,287

The collisions investigated by the Commission which occurred in automatic block signal territory due directly or indirectly to the failure of enginemen to observe or be governed by signal indications from July 1, 1911, to March 31, 1922, numbered 80 which resulted in the death of 416, the injury of 1,837 and a property loss of \$1,081,583.35. This loss did not include damage to lading. In addition to the above and among other exhibits presented by Mr. List was one listing the roads cited in the proposed order on train control giving their total automatic block signal mileage; total passenger lines operated; territory designated in the Commission's order of January 10; mileage covered by this

territory and the automatic block signal mileage in it with certain explanatory notes.

American Train Control Corporation

C. W. Hendrick, in presenting his brief, stated that "after 14 years, on the part of the Commission, through its safety division, to secure the co-operation of the railroads by getting them to recognize that the present wayside signals are not giving sufficient protection, your Commission, after careful and extensive investigation, and not until two years after the passage of the Transportation Act giving you power, did you take any positive action until the issuance of the present order now under discussion. For this committee (the Carrier's Committee) to come forward at this late date and endeavor to discredit your investigation and order by trying to show that train control is in an undeveloped stage and does not warrant you having issued the order is clearly a desire on their part to secure further delay, which is largely based on prejudice. We are perfectly justified in taking the stand that wayside signals are also in a developing stage * * * after 30 years of development. Knowing that a first impression is difficult to overcome, special efforts have been made to create an unfavorable impression by magnifying small things and belittling important accomplishments of train control, at the same time praising wayside signals."

Mr. Hendrick told how long freights can be handled on mountain grades without danger of losing the air through gradual application. Regarding the service record on the Chesapeake & Ohio, attention was called to the testimony of the signal engineer in which he stated that during two years of service, out of 1,120,000 operations there were only two false clear failures. The objections of the Carrier's Committee were next answered in detail.

In speaking of installation costs, Mr. Hendrick said that he did not want these costs mixed up with the cost of signals and that the costs should be based on three things:

(1) Installation of train control in connection with wayside signals, when wayside signals are provided. (2) Installation of train control when no wayside signals are provided. (3) Apparatus to be supplied for the engine equipment. The approximate cost of this system was given for installations where wayside signals are already in. Engine equipment was listed at \$850; each ramp location at \$200 and the cost of attaching the equipment to engines is \$50 per engine. Maintenance costs were given as \$14.03 per engine per month. In concluding his brief, Mr. Hendrick said that "if you (the Commission) defer the issue, you can rest assured the signal companies, who have been advising the railroads through these years of opposition, will not work overtime to aid in developing a system that will eventually cause them a heavy loss by putting the wayside signals in the same class as the horse car is to the electric car." C. C. Paulding, attorney for the railroads, asked Mr. Hendrick on what grounds he based his charge that the railroads were influenced by signal companies and he stated that it was from general observation. Mr. Hendrick was asked if that was basis enough on which to make such grave charges and he could not present any specific instances to substantiate his statement.

B. F. Wooding Presents Brief

Dr. Wooding said: "If all the presidents of railways were to appear before your Honorable Commission and it was

put up to them that they must either kill one of their number each year or install all the railroads with the automatic train control, can you guess what their answer would be?" Dr. Wooding gave a description of his device and told of the difficulties experienced in developing it and the trouble he had in arranging for and conducting experiments on the railroads. In touching on the induction type of train control he said that it "is far behind the contact, though having had every advantage with the latter. * * * With the contacts * * * all complications and uncertainties are eliminated which are common to the transference of electrical impulses in comparison with definite mechanical operation. Besides, the maintenance cost for current along the roadway cannot help but be expensive."

The cost for locomotive equipment was placed at \$450; track equipment for 100 trains daily, complete, \$800; 200 trains daily, \$900 and for 300 trains daily, \$1,000. Fixed charges for locomotive maintenance, if the battery is charged from the headlight dynamo was placed at from \$2 to \$5 per month while that for track maintenance was placed at \$5 for 100 trains a day; \$10 for 200 trains a day and \$15 for 300 trains.

Commissioner McChord asked if he thought that engineers would be less alert with train control than without it and was answered in the negative. Dr. Wooding explained why he felt that an emergency application of the brakes should be made and stated that it would be a mistake for the railroads to make installations of signals without also installing train control. Interlocking construction, in his opinion, could well be delayed until after installations of train control.

F. J. Sprague Takes the Stand

Stating that many of the objections raised to train control were of the "rubber stamp" type, F. J. Sprague said that it was unfortunate that the same committee of the American Railway Association which had been appointed to co-operate with the Commission was the one to handle the case against train control for the carriers. He pointed out that the opposition raised by the railroads to the adoption of Section 26 of the Transportation Act was based largely on a statement made by S. M. Felton, president of the Chicago & Great Western, who had ventured in a field of prophecy already disproved by facts. Mr. Sprague felt that the Carrier's Committee could have done much better had it offered constructive criticisms rather than presenting every defect against the devices found in service. The wayside signals, in his estimation, gave only a limited indication of traffic conditions ahead and that if an accident happened every time an engineman passed a red signal the newspapers would be as full of them as they are of automobile accidents. Accident statistics, he stated, were a dry menu for the widows and orphans and as to the victims themselves it was a 100 per cent loss. In giving a general description of his device, Mr. Sprague said that he had adopted certain requirements which he felt should be met and that the application of magnetic induction to other fields such as the telegraph, electric railways, signal systems, etc., proves that it is available for the train control field and that any system, in his opinion, should be a thorough mentor and guide to the engineman to assist him in his work. He stated that the price for his equipment would be furnished those railroads asking for estimates and that estimates given by the railroads were absurd.

When the meeting adjourned the Miller Train Control Corporation was presenting its brief which was continued over for the Thursday morning session. Other train control companies yet to be heard in the order of their hearing are the Simmen, Shadle, Webb, Schwyer, Clifford, Richards, Wharton, Bevin-Wallace, General Railway Signal Company, Finnegan and Regan.

Railways Should Make Vast Expenditures

THE RAILWAYS of the United States should spend one and one-half billion dollars per year on enlargements and extensions to bring their facilities up to the point that they were in 1914 with reference to the business of the country, according to W. B. Storey, president of the Atchison, Topeka & Santa Fe. Mr. Storey made this statement in the course of an address before the eighth annual conference of the seventeenth district of the International Association Rotary Clubs at Muskogee, Okla., on March 31. In discussing the railway situation of today, Mr. Storey based his arguments on the two facts that the railways and the people are interdependent and that the roads must build and grow as the country grows. He spoke in part as follows:

"In regard to the first, the people of this country are absolutely dependent on the railways. This country has developed only by reason of the transportation afforded by the railways. The railways are necessary to bring in all necessities of life—to bring in coal and supplies of all kinds and carry away all produce. They may be likened to the circulatory system of the body and are as essential to the life of the country as the arteries and veins are to the health of the human system. Conversely, the railways are just as dependent on the people. They must have people to serve, to give them business and hence life. A railway goes into a new country, finds no people—hence no products to haul—and generally loss results. Many railways went bankrupt because they did not recognize this until too late. The Santa Fe made this mistake in that it over-extended too rapidly, and as a consequence 30 years ago it became bankrupt. Now it adds mileage only as fast as it can be digested; that is, made productive. We count on a new branch being unproductive for a few years. * * *

"The second fact is that the railways must build and grow as the country grows. This means that branches must be built, that additions in the way of sidings and new and larger stations must be provided, that more cars and more locomotives must be bought, with the shops and roundhouses to take care of them. Secretary Hoover, in a recent statement before the Interstate Commerce Commission, used the following language:

"One thing is absolute—our transportation facilities are below the needs of our country and unless we have a quick resumption of construction the whole community, agricultural, commercial and industrial, will be gasping from a strangulation caused by insufficient transportation the moment that our business activities resume."

"To give you some idea of what this matter of growth means on a road like the Santa Fe, we expended for extensions, for additions and betterments, and for equipment over \$20,000,000 a year for the five years prior to 1914. This has nothing to do with the ordinary expenditures for maintenance, but is new money put into new appliances to take care of the growth of the country along our lines. That amount of money today will not buy or provide the same that it would. Twenty millions then means forty now. * * *

"The same situation obtains on all other roads throughout the country, and applying the same expenditure to the entire mileage of the country we find the prodigious total of one and one-half billion dollars which ought to be expended on enlargements and extensions alone per year for three years to bring the railroads of the United States up to date. Mr. Hines, in testimony before the Interstate Commerce Commission on January 31, last, said: 'It would be a conservative estimate to say that for several years the public interest would be promoted if about a billion dollars a year could be expended for this purpose.' Mr. Hines' figures are large, but I believe them not large enough, and in my judgment one and one-half billions should be spent."

General News Department

Z. G. Hopkins, assistant to the chief operating officer of the Missouri, Kansas & Texas, with headquarters at St. Louis, Mo., addressed the St. Louis Railway Club on Friday evening, April 14, on "The Field for a Railroad Bloc."

Union Pacific's Proposed Expenditures

The Union Pacific has recently announced its intention to spend \$29,000,000 for additions, betterments, equipment, and extensions during 1922. The construction of three short extensions is contemplated, and \$9,200,000 has been set aside for new equipment. The major portion of this sum will be for freight cars, for which a large number of contracts have already been let. The Pacific Fruit Express, which is jointly owned by the Union Pacific and the Southern Pacific, will spend \$9,000,000 for betterments during the ensuing year, of which sum \$8,000,000 will be spent for new equipment and \$1,000,000 for new ice plants.

A Correction

In the article entitled "New Specifications for Rail," which appeared on page 828 of the *Railway Age* of April 1, the statement was made that the rail manufacturers had agreed to accept orders for rails to be rolled in accordance with the new experimental specifications this year without additional charge. While this statement is in the main correct, it has given rise to some misunderstanding. The facts are that some mills have agreed to permit a portion of the 1922 tonnage to be rolled under this experimental specification for the purpose of ascertaining the practicability of this specification and with the understanding that for the specific test tonnage (the amount of which is to be determined by agreement between the mill and the road in question) there is to be no extra charge.

D. T. & I. Earnings Increasing

The Detroit, Toledo & Ironton, which had shown a steady reduction in net operating income since last April, until it had a deficit of \$331,000 for December, has been showing an improvement since then, according to its reports filed with the Interstate Commerce Commission, as its traffic and earnings have increased. In January the road had a net operating income of \$23,159, while for February it was \$131,538. For the corresponding two months of 1921 the road showed a deficit of \$311,370. For the first two months of 1922 the operating revenues were \$1,056,022, an increase of \$617,425 over 1921, while operating expenses were \$764,464, an increase of \$99,364. Expenditures for maintenance of way and structures were \$55,328 less than for the corresponding months of 1921, while expenditures for maintenance of equipment were \$31,697.

The Air Mail

The Airplane Mail Carriers, carrying mail between New York and San Francisco, have flown, since July, 1921, about one million miles; and 94 per cent of the trips were completed satisfactorily. In that time there has been but one accident, a pilot falling from a distance of 300 feet at San Francisco while flying in a plane without mail. He was killed. No other accident, fatal or non-fatal, is recorded. This and other facts are given in an article published in the Union Pacific Magazine for February, by A. R. Dunphy, superintendent of the Central Division of the Air Mail Service. In the three years and three months prior to last July, 21 pilots and eight mechanics or other employees were killed, an average of one death to every 75,000 miles flown. Mr. Dunphy says that the New York-Washington air mail was discontinued on July 1, 1921, the appropriation for the current fiscal year having made no provision for that, or for any line except the one between New York and San Francisco. He gives interesting data concerning the machines used and condenses figures showing the

volume of traffic since the beginning of this service, which was on May 15, 1918. He also relates some of the thrilling adventures of the flyers in the Rocky Mountains.

April Meeting of the New York Railroad Club

Harrington Emerson, of the Emerson Engineers, who will be the principal speaker at the meeting of the New York Railroad Club to be held on April 21 at the Engineering Societies' Building at 8 p. m., was from December, 1920, to June, 1921, field director as to wastes in transportation in the study which the Federated American Engineering Societies made of the elimination of waste in industry. During the summer of 1921 he went abroad and studied railway conditions in England, France and Germany. He then spent three months in Mexico, studying the national railways of that country at the request of the Mexican government.

The railways of all countries are suffering from the same difficulties. Mr. Emerson will attempt to diagnose the troubles that have recently come upon the railway world and will suggest remedies. His address will be illustrated with charts and diagrams.

Illinois Central Plans Hotel on Wheels

The Illinois Central is preparing to house 6,000 of the 30,000 visitors expected to attend the triennial conclave of Knights Templar to be held in New Orleans, La., April 24-27. There will be a hotel on wheels, consisting of 250 Pullman sleeping cars, in the railroad's Poydras yards, between Poydras and Lafayette streets, and extending five blocks from Magnolia to Saratoga streets. To provide the necessary space, eleven new tracks are being built.

The sleeping cars will be operated after the pattern of a miniature city, with dining cars at convenient intervals. A section of warehouse No. 3 is being converted into a temporary clubhouse, containing toilets, 24 shower baths, a three-chair barber shop, and a laundry agency. The municipal water supply will be tapped with laterals leading to each car. Two locomotives will furnish steam for heating the cars and the clubhouse. The railroad company is spending about \$65,600. In addition to the facilities in Poydras yard tracks will be laid on neighboring territory immediately east of the yard, and this will be available as parking space for more cars, while if still more space is needed, cars will be switched to several tracks directly west of the Union station. Arrangements have been made for the handling of 200 cars.

Production of Non-Union Coal Fields

Conditions in some of the more important fields are reported by the Coal Review to be as follows:

In the non-union fields of Pennsylvania production is running at about the pre-strike rate. In the non-union fields of Eastern Kentucky and Tennessee, output is not up to normal solely because of lack of orders for coal.

West Virginia, with operation for the entire State at 65 per cent of normal, is held down by lack of orders. The Kanawha Field of West Virginia reports 1,250 cars standing unsold and that, if there were sufficient orders on hand to justify running the mines, a larger percentage of the men now idle would return to work under conditions offered them by the operators on April 1. In the Winding Gulf Field of West Virginia, 4,200 cars are standing unsold on the tracks.

Ohio, Indiana and Illinois are nearly 100 per cent closed down, but a large number of cars loaded during the last week before the strike are still unsold. West of Mississippi, union mines are closed; non-union mines are operating so far as orders for coal enable the mines to run.

Western Kentucky reports that, while a large number of mines are not working, the explanation is to be found in the lack of orders and the unsold cars of coal already standing at the mines.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922

Name of road.	Average mileage covered during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equip-ment.	Traffic.				
Alabama & Vicksburg.....	Feb. 141	\$165,889	\$48,302	\$214,191	\$39,084	\$53,903	\$9,079	89.40	\$24,360	\$4,163	\$13,044
Vicksburg, Shreveport & Pacific.....	2 mos. 141	333,510	106,875	440,385	75,703	106,365	18,019	89.90	47,409	9,155	5,681
Ann Arbor.....	Feb. 171	182,610	78,574	261,184	39,576	49,347	9,247	80.50	54,530	36,653	30,687
Ann Arbor.....	2 mos. 171	360,715	172,516	533,231	82,230	121,034	18,381	85.80	80,982	46,126	23,919
Archison, Topeka & Santa Fe.....	Feb. 293	307,564	35,888	343,452	38,370	45,918	8,533	75.90	85,945	66,445	47,758
Atlanta & West Point.....	2 mos. 293	604,896	80,421	685,317	123,743	153,437	18,832	83.50	117,482	78,969	21,085
Atlanta & West Point.....	2 mos. 8,855	8,046,989	3,238,758	11,285,747	1,449,213	3,963,368	438,826	78.80	2,627,831	1,604,502	1,185,067
Atlanta & West Point.....	2 mos. 8,860	16,108,726	6,611,886	22,720,612	3,123,803	6,963,368	894,852	81.60	4,561,734	2,548,766	2,473,231
Baltimore & Annapolis.....	Feb. 1,907	1,148,779	256,866	1,405,645	399,138	459,847	38,400	101.30	18,864	-92,562	-198,985
Baltimore & Annapolis.....	2 mos. 1,907	2,365,285	538,670	2,903,955	865,884	1,002,292	1,131,437	103.80	-116,875	-202,021	-402,664
Baltimore & Annapolis.....	2 mos. 8,57	413,928	84,454	498,382	80,822	197,728	5,761	91.40	45,217	22,325	19,356
Baltimore & Annapolis.....	2 mos. 8,57	809,075	187,482	996,557	195,702	407,435	12,782	99.50	5,454	-40,234	-120,262
Baltimore & Annapolis.....	2 mos. 93	75,532	62,608	138,140	23,448	36,386	7,700	95.30	7,420	-1,928	-10,172
Baltimore & Annapolis.....	2 mos. 93	171,194	131,683	302,877	48,283	86,498	15,714	95.00	17,212	-1,309	-16,780
Baltimore & Annapolis.....	2 mos. 133	97,558	47,347	144,905	24,361	44,362	7,464	95.50	7,211	-1,464	-2,707
Baltimore & Annapolis.....	2 mos. 133	195,261	131,901	327,162	48,096	93,578	15,229	92.60	25,290	11,840	13,516
Baltimore & Annapolis.....	2 mos. 639	224,349	28,933	253,282	84,031	107,863	21,740	117.80	-48,960	-68,026	-78,644
Baltimore & Annapolis.....	2 mos. 639	444,167	63,522	507,689	109,863	175,090	42,768	120.70	-113,595	-152,072	-176,387
Baltimore & Annapolis.....	2 mos. 4,923	3,886,754	1,256,628	5,143,382	606,000	1,115,552	2,117,351	73.90	1,835,644	1,576,125	1,489,333
Baltimore & Annapolis.....	2 mos. 4,923	7,311,653	3,360,299	10,671,952	1,269,135	2,071,726	4,314,381	73.90	2,947,996	2,432,024	2,267,590
Baltimore & Annapolis.....	2 mos. 342	189,410	36,562	225,972	33,604	60,004	6,120	86.20	32,942	21,862	22,113
Baltimore & Annapolis.....	2 mos. 342	382,385	72,303	454,688	90,004	128,266	12,487	89.30	50,868	28,694	21,456
Baltimore & Annapolis.....	2 mos. 5,235	12,414,188	1,804,807	14,218,995	2,997,327	5,747,323	6,268,608	80.10	2,983,723	2,327,341	2,071,125
Baltimore & Annapolis.....	2 mos. 5,235	23,684,360	3,915,565	27,599,925	3,801,034	5,747,323	12,505,991	81.30	5,457,558	4,138,575	3,594,230
Baltimore & Annapolis.....	2 mos. 90	209,522	25,166	234,688	26,201	34,709	1,592	96.30	7,673	-30,683	-84,069
Baltimore & Annapolis.....	2 mos. 90	410,607	37,496	448,103	59,069	77,777	3,349	95.60	18,794	58,832	152,709
Baltimore & Annapolis.....	2 mos. 23	78,744	16,508	95,252	27,108	34,709	2,140	105.50	-9,179	-24,605	-37,523
Baltimore & Annapolis.....	2 mos. 23	140,963	32,194	173,157	73,294	77,777	3,502	122.80	-74,303	-107,185	-118,396
Baltimore & Annapolis.....	2 mos. 625	605,631	72,269	677,900	106,229	135,867	20,967	67.70	225,397	183,667	186,978
Baltimore & Annapolis.....	2 mos. 625	1,187,409	150,406	1,337,815	209,129	257,481	47,790	67.40	448,762	367,176	376,627
Baltimore & Annapolis.....	2 mos. 32	495,621	27,504	523,125	75,937	107,774	21,810	63.20	182,583	151,909	152,754
Baltimore & Annapolis.....	2 mos. 32	932,055	52,713	984,768	107,774	144,444	44,715	67.30	304,930	241,462	285,121
Baltimore & Annapolis.....	2 mos. 225	535,961	27,619	563,580	58,134	85,134	11,756	101.80	10,611	-43,500	-119,746
Baltimore & Annapolis.....	2 mos. 225	1,046,330	59,011	1,105,341	122,494	160,930	27,710	103.70	99,145	-164,738	-121,852
Baltimore & Annapolis.....	2 mos. 35	9,364	9,618	19,982	18,170	3,108	4,495	32.90	-21,538	-27,300	-21,482
Baltimore & Annapolis.....	2 mos. 35	19,151	19,500	38,651	36,404	5,725	2,547	314.20	-47,761	-53,832	-44,469
Baltimore & Annapolis.....	2 mos. 2,287	3,760,802	1,608,048	5,368,850	821,608	1,105,275	2,947,260	86.90	774,608	611,305	346,840
Baltimore & Annapolis.....	2 mos. 2,287	7,217,043	3,359,748	10,576,791	1,691,477	2,325,272	6,041,918	91.00	1,634,710	1,080,098	1,824,549
Baltimore & Annapolis.....	2 mos. 9	118,696	127,168	245,864	6,167	11,198	338	60.20	50,670	44,211	44,211
Baltimore & Annapolis.....	2 mos. 9	226,811	242,078	468,889	10,592	35,344	96,370	62.80	90,079	77,381	77,381
Baltimore & Annapolis.....	2 mos. 253	182,636	6,126	188,762	18,367	25,481	6,023	76.70	44,729	41,499	62,996
Baltimore & Annapolis.....	2 mos. 253	343,878	12,780	356,658	58,281	111,328	11,870	85.40	53,094	46,594	91,655
Baltimore & Annapolis.....	2 mos. 589	1,134,603	1,297,711	2,432,314	101,199	373,899	13,530	77.80	287,516	252,516	270,303
Baltimore & Annapolis.....	2 mos. 589	2,169,604	264,719	2,434,323	227,225	755,937	29,601	81.30	470,900	400,454	430,987
Baltimore & Annapolis.....	2 mos. 233	237,205	30,552	267,757	22,929	65,536	4,025	89.10	30,937	14,937	1,080
Baltimore & Annapolis.....	2 mos. 233	444,734	66,454	511,188	44,545	117,543	8,503	87.40	70,000	38,900	11,474
Baltimore & Annapolis.....	2 mos. 291	543,331	31,902	575,233	67,642	134,811	15,645	67.80	187,732	147,710	191,188
Baltimore & Annapolis.....	2 mos. 291	1,098,224	68,316	1,166,540	137,648	263,848	44,332	67.30	386,291	306,162	383,414
Baltimore & Annapolis.....	2 mos. 1,913	1,109,877	389,824	1,499,701	225,825	312,417	65,382	81.30	305,845	220,825	251,433
Baltimore & Annapolis.....	2 mos. 1,913	2,061,425	795,004	2,856,429	444,346	640,434	130,392	86.60	421,132	254,361	310,227
Baltimore & Annapolis.....	2 mos. 685	3,231,678	607,232	3,838,910	384,238	1,339,446	93,536	85.50	584,457	341,354	310,227
Baltimore & Annapolis.....	2 mos. 685	6,290,741	1,249,585	7,540,326	790,093	2,538,986	164,657	86.70	1,062,281	546,430	508,012
Baltimore & Annapolis.....	2 mos. 413	364,780	85,543	450,323	45,314	100,625	27,063	91.90	39,646	22,692	3,961
Baltimore & Annapolis.....	2 mos. 413	687,463	179,397	866,860	98,972	199,974	54,983	92.50	72,343	10,714	57,067
Baltimore & Annapolis.....	2 mos. 2,548	6,081,352	649,082	6,730,434	725,669	1,642,641	148,686	75.50	1,712,943	1,443,640	1,439,885
Baltimore & Annapolis.....	2 mos. 2,548	10,945,290	1,414,890	12,360,180	1,325,682	3,158,344	316,096	77.70	2,865,498	2,338,388	2,468,039
Baltimore & Annapolis.....	2 mos. 1,050	1,975,214	423,991	2,399,205	161,913	331,627	54,893	72.20	1,712,901	637,598	417,007
Baltimore & Annapolis.....	2 mos. 1,050	3,777,416	911,562	4,688,978	394,765	1,255,957	114,513	76.90	1,151,735	1,001,121	1,001,121
Baltimore & Annapolis.....	2 mos. 945	1,636,725	332,192	1,968,917	198,554	490,732	66,618	78.00	458,522	373,319	317,427
Baltimore & Annapolis.....	2 mos. 945	3,159,033	717,562	3,876,595	490,732	1,023,631	132,447	80.70	797,480	626,678	577,921
Baltimore & Annapolis.....	2 mos. 8,402	6,909,316	2,077,869	8,987,185	1,053,122	2,247,216	145,854	88.60	1,124,419	385,893	309,797
Baltimore & Annapolis.....	2 mos. 8,402	13,487,592	4,390,385	17,877,977	2,085,172	4,722,559	311,124	91.00	1,793,276	321,827	158,493
Baltimore & Annapolis.....	2 mos. 9,393	9,321,477	1,911,520	11,232,997	868,536	2,687,105	311,122	72.40	3,331,475	2,408,746	2,403,646
Baltimore & Annapolis.....	2 mos. 9,393	17,863,628	4,051,431	21,915,059	1,960,879	5,457,590	694,018	76.80	5,513,524	3,676,187	3,555,701
Baltimore & Annapolis.....	2 mos. 1,496	1,305,038	313,297	1,618,335	147,253	441,109	64,527	87.30	222,141	131,457	19,232
Baltimore & Annapolis.....	2 mos. 1,496	2,466,619	660,706	3,127,325	294,250	941,460	128,366	93.80	210,265	35,979	57,609
Baltimore & Annapolis.....	2 mos. 657	905,218	1,204,058	2,109,276	236,290	512,509	37,135	75.40	296,608	242,545	136,100
Baltimore & Annapolis.....	2 mos. 657	1,719,501	443,940	2,163,441	234,191	512,509	68,107	77.90	520,541	415,199	220,638

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Maintenance of way and structures			Operating expenses			Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Equip. ment.	Structures.	Way.	Traffic.	Trans- portation.	General.	Total.			
Chicago Junction	Feb. 12	.....	.....	\$434,342	\$39,008	\$37,986	\$37,986	\$607	\$202,785	\$10,186	\$200,572	66.90	\$143,270	\$168,390
Chicago, Milwaukee & St. Paul	2 mos. 11,030	\$7,773,932	\$1,620,974	10,400,775	75,664	75,664	75,664	1,371	404,272	19,855	579,003	70.00	247,791	228,541
Chicago, Peoria & St. Louis	2 mos. 11,630	137,28,834	3,496,290	21,275,022	2,580,581	2,580,581	2,580,581	367,331	10,326,079	630,808	10,956,887	97.20	930,268	87,018
Chicago, Rock Island & Pacific	2 mos. 7,661	12,039,841	1,794,187	8,532,715	1,187,147	1,187,147	1,187,147	4,358	113,528	10,354	196,447	96.80	6,496	1,345,805
Chicago, Rock Island & Gulf	2 mos. 4,61	329,114	72,357	436,801	43,981	43,981	43,981	13,088	202,963	14,084	346,678	79.40	90,123	62,820
Chicago, St. Paul, Minn. & Omaha	2 mos. 1,749	1,370,683	442,086	1,921,077	241,536	241,536	241,536	26,805	141,940	27,735	197,747	84.00	145,581	119,747
Cinn., Indianapolis & Western	2 mos. 3,21	287,918	44,638	339,416	72,305	72,305	72,305	12,745	161,920	22,478	304,349	87.10	45,067	7,396
Colorado & Southern	2 mos. 1,299	731,325	94,062	669,495	69,315	69,315	69,315	22,740	321,369	42,881	602,688	90.00	66,807	37,791
Ft. Worth & Denver City	2 mos. 4,54	500,627	142,844	679,007	68,576	68,576	68,576	16,742	239,393	36,812	502,699	77.00	176,308	144,183
Wichita Valley	2 mos. 2,56	96,232	319,441	1,351,838	149,589	292,024	21,678	502,568	74,413	1,050,579	237,475	77.70	301,259	249,155
Columbus & Greenville	2 mos. 2,26	65,268	25,011	95,704	24,279	13,854	44,451	4,204	161,920	22,478	304,349	100.40	96,129	16,827
Delaware & Hudson	2 mos. 887	3,208,578	253,423	3,807,683	359,050	359,050	359,050	6,741	96,201	16,890	195,077	90.00	21,775	15,915
Delaware, Lackawanna & Western	2 mos. 994	4,456,779	963,252	6,072,949	505,135	1,342,247	107,077	2,512,560	158,203	4,671,284	6,741,284	76.90	1,401,665	925,515
Denver & Rio Grande Western	2 mos. 2,593	1,727,008	351,187	2,214,113	1,064,556	2,714,680	21,678	502,568	74,413	1,050,579	237,475	77.70	301,259	249,155
Denver & Salt Lake	2 mos. 2,55	113,316	13,790	144,881	20,745	39,267	911	53,889	168,388	3,291,287	3,291,287	72.40	1,254,805	944,331
Detroit & Mackinac	2 mos. 385	127,286	52,410	193,217	38,990	96,260	4,719	11,644	11,351	266,635	266,635	136.60	31,715	4,715
Detroit & Toledo Shore Line	2 mos. 61	339,159	.....	361,397	16,910	22,738	2,064	98,525	18,525	7,013	147,250	40.70	214,147	200,147
Detroit, Toledo & Ironton	2 mos. 454	598,624	8,730	616,586	71,356	106,233	7,131	220,137	17,580	42,347	674,464	44.60	348,914	320,914
Duluth & Iron Range	2 mos. 294	62,417	15,127	93,282	46,551	86,942	883	103,869	16,820	255,065	255,065	273.40	161,783	167,099
Duluth, Missabi & Northern	2 mos. 405	51,107	34,925	98,430	79,941	112,191	2,493	141,191	19,477	504,446	504,446	261.30	311,376	324,124
Duluth, South Shore & Atlantic	2 mos. 591	155,688	65,845	247,795	63,292	238,096	2,622	176,898	10,789	300,249	300,249	121.20	52,454	79,454
Duluth, Winnipeg & Pacific	2 mos. 178	126,545	16,747	148,250	22,947	43,740	5,868	79,655	35,143	23,032	61,065	118.50	9,574	19,479
Elgin, Joliet & Eastern	2 mos. 839	1,512,753	.....	1,644,366	110,100	302,044	13,990	474,171	32,408	932,624	932,624	66.70	711,742	630,493
El Paso & Southwestern	2 mos. 1,139	567,200	173,143	786,549	139,872	141,853	25,643	191,513	42,205	550,243	550,243	69.90	236,306	137,132
Erie	2 mos. 1,989	6,273,640	920,169	7,638,078	655,110	2,104,830	126,764	3,221,873	268,850	6,417,957	6,417,957	83.80	1,240,121	963,726
Chicago & Erie	2 mos. 269	1,504,821	39,712	842,538	88,005	115,709	17,969	426,899	33,784	683,062	683,062	81.30	157,476	103,806
New Jersey & New York	2 mos. 47	21,142	88,630	113,553	12,032	19,053	1,301	63,233	2,541	98,160	98,160	86.40	15,393	12,393
N. Y. Susquehanna & Western	2 mos. 135	234,529	56,117	337,200	52,588	52,588	3,333	181,266	5,813	206,687	206,687	90.50	21,820	15,810
Florida East Coast	2 mos. 764	681,773	615,695	1,443,149	160,955	179,615	17,532	391,337	26,748	802,906	802,906	55.60	640,243	591,315
Fort Smith & Western	2 mos. 249	81,980	17,865	107,493	23,323	33,323	4,887	43,328	6,930	104,527	104,527	97.20	2,966	2,858
Galveston Wharf	2 mos. 13	.....	101,041	56,698	4,365	669	25,075	3,913	108,026	108,026	108,026	106.90	6,985	26,017
Georgia	2 mos. 328	230,832	79,127	332,723	34,158	61,573	19,850	18,692	226,481	226,481	226,481	110.00	20,543	56,575
Georgia & Florida	2 mos. 405	82,420	24,551	101,480	16,975	20,376	7,082	40,944	19,443	12,975	19,443	90.80	9,368	3,083
Grand Trunk Western	2 mos. 351	1,683,552	280,351	2,093,422	167,314	481,601	57,254	1,111,535	103,065	1,934,063	1,934,063	92.40	159,359	346,881

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—Total			Operating expenses—			Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
		Freight.	Passenger.	(inc. misc.)	Maintenance of way and structures.	Equipment.	Traffic.	Trans- portation.				
Atlantic & St. Lawrence.....	Feb. 166	\$277,722	\$323,615	\$24,825	\$43,296	\$2,944	\$151,999	\$12,931	\$239,080	\$73,198	\$84,142	\$105,893
Chi., Det. & Canada Gr. Tr. Jct.....	Feb. 166	105,864	67,704	55,021	94,534	9,658	308,707	24,669	490,866	81,778	109,364	187,080
Chi., Det. & Canada Gr. Tr. Jct.....	Feb. 62	161,322	7,348	180,694	10,934	14,849	59,448	5,038	92,670	51,300	86,024	49,463
Chi., Det. & Canada Gr. Tr. Jct.....	2 mos. 62	329,097	21,883	382,305	23,097	20,868	126,789	7,725	185,866	48,600	196,439	131,920
Detroit, Grand Haven & Milwaukee.....	Feb. 194	266,666	31,764	319,848	24,179	46,479	204,273	17,470	300,869	94,100	18,979	28,938
Great Northern.....	Feb. 194	525,671	70,684	645,283	62,731	67,056	395,160	33,211	576,975	89,400	68,308	73,854
Green Bay & Western.....	Feb. 8,265	4,139,638	937,216	5,703,628	772,946	1,205,483	2,916,897	187,052	5,261,582	92,200	442,046	894,649
Gulf & Ship Island.....	Feb. 8,265	8,357,134	1,998,538	11,599,845	1,400,065	2,650,115	2,38,578	454,611	10,913,747	94,100	686,098	2,449,826
Gulf, Mobile & Northern.....	Feb. 262	73,642	16,785	97,939	17,130	15,952	39,003	30,019	77,323	78,900	20,616	8,288
Hocking Valley.....	Feb. 262	152,595	36,884	203,498	33,049	32,092	85,866	5,685	160,691	26,807	42,807	20,496
Illinois Central.....	Feb. 307	337,475	72,607	434,944	85,663	78,782	140,885	22,334	342,612	78,700	92,332	18,519
International & Great Northern.....	Feb. 436	270,164	32,174	314,137	50,470	54,966	110,452	15,083	243,312	77,400	70,825	432,289
Kansas City, Mexico & Orient.....	Feb. 436	551,019	69,309	643,965	107,422	108,518	232,216	33,609	508,656	78,900	135,309	102,021
Kansas City Southern.....	Feb. 350	940,686	76,891	1,058,942	94,392	209,557	1,378	30,218	710,129	67,100	348,813	282,513
Kans. City, Mex. & Orient of Tex.....	Feb. 350	1,752,721	163,548	1,997,237	196,082	395,832	21,886	61,760	1,396,550	69,900	609,687	419,348
Lehigh & Hudson River.....	Feb. 4784	9,066,687	1,761,343	11,516,003	1,248,589	2,254,591	4,166,665	297,169	8,183,616	71,100	3,332,387	1,519,835
Lehigh & New England.....	Feb. 4784	17,732,382	3,670,942	22,715,101	2,610,779	4,706,007	8,503,678	597,302	16,872,843	74,300	5,842,328	3,573,363
Louisiana & Arkansas.....	Feb. 1,381	937,404	289,346	1,301,284	313,018	256,851	25,778	589,437	1,240,814	94,600	70,470	48,057
Louisiana Ry. & Nav. Co.....	Feb. 1,381	1,943,738	633,328	2,710,869	611,156	549,523	1,253,322	96,021	2,559,895	94,400	150,974	101,604
Louisville & Nashville.....	Feb. 1,159	722,383	180,131	1,001,660	144,668	177,895	476,996	53,131	883,864	88,200	117,796	189,386
Louisville, Henderson & St. Louis.....	Feb. 1,159	1,459,146	372,238	2,038,020	314,158	350,356	1,006,327	100,381	1,833,182	89,900	204,838	135,455
Maine Central.....	Feb. 272	95,939	7,975	113,117	24,933	26,870	58,788	6,696	119,060	105,100	5,743	23,536
Midland Valley.....	Feb. 272	185,345	18,001	220,759	51,429	53,894	123,908	12,882	249,521	113,000	29,361	42,404
Missouri, Kansas & Texas.....	Feb. 465	98,261	8,310	113,887	25,919	29,501	76,756	9,337	142,448	126,000	29,361	35,400
Mo., Kansas & Texas of Texas.....	Feb. 465	187,605	19,616	219,718	54,790	76,364	152,762	12,526	304,941	138,800	85,223	97,249
Northwestern.....	Feb. 779	1,127,956	149,341	1,386,829	154,052	269,487	35,578	64,886	1,039,403	74,900	347,426	230,677
Omaha & Great Northern.....	Feb. 779	2,210,052	300,605	2,715,925	307,114	532,412	1,006,960	134,572	2,055,253	75,700	660,672	463,978
Omaha & Great Northern.....	Feb. 93	137,262	13,086	161,770	11,813	24,747	4,918	8,581	97,234	60,400	64,046	3,698
Oklahoma & Gulf.....	Feb. 93	292,709	27,057	343,332	53,676	53,676	101,989	16,759	211,137	61,400	132,995	81,907
Omaha & Great Northern.....	Feb. 314	171,727	10,450	189,556	36,769	23,557	75,039	9,588	150,089	70,200	39,467	25,788
Omaha & Great Northern.....	Feb. 314	358,940	23,695	397,836	79,974	49,377	157,359	19,467	316,710	79,600	81,126	19,206
Lake Superior & Ishpeming.....	Feb. 33	1,033	89	1,088	33,671	8,106	9,109	2,465	53,560	49,280	52,472	52,973
Lake Terminal.....	Feb. 33	2,569	212	2,987	48,667	15,774	18,004	5,465	88,334	2,956,054	85,337	93,891
Lehigh & Hudson River.....	Feb. 13	87,524	4,887	6,811	4,887	6,811	36,625	23	47,946	54,800	39,578	602
Lehigh & New England.....	Feb. 13	169,370	8,591	1,128	8,591	1,128	74,457	79	97,255	57,400	72,115	77,888
Lehigh Valley.....	Feb. 96	211,211	3,723	223,984	21,627	46,762	73,090	6,744	149,854	66,900	74,100	12,065
Los Angeles and Salt Lake.....	Feb. 96	402,636	8,253	420,639	50,354	96,639	163,678	13,418	327,102	76,300	101,800	36,344
Louisiana & Arkansas.....	Feb. 237	380,876	2,013	388,969	33,617	188,175	7,762	13,263	382,691	98,400	6,278	7,037
Louisiana Ry. & Nav. Co.....	Feb. 237	725,970	4,268	741,835	62,736	424,897	266,448	30,747	797,924	107,600	56,089	53,579
Louisville & Nashville.....	Feb. 1,448	4,638,326	446,898	5,392,208	486,860	1,431,490	2,350,967	118,074	4,510,486	83,600	881,722	492,242
Louisville, Henderson & St. Louis.....	Feb. 1,448	8,907,433	966,737	10,522,299	995,819	2,786,449	4,332,609	246,370	9,109,026	86,500	1,419,273	923,484
Louisville, Henderson & St. Louis.....	Feb. 1,159	932,416	311,993	1,367,178	249,096	345,449	40,554	38,696	1,259,832	90,000	137,346	83,979
Louisiana & Arkansas.....	Feb. 1,159	1,890,809	696,496	2,840,718	512,132	674,795	1,076,378	80,654	2,510,245	88,400	330,473	24,790
Louisiana Ry. & Nav. Co.....	Feb. 302	201,297	30,523	237,518	52,615	45,920	81,727	7,853	194,648	82,000	42,870	18,812
Louisiana Ry. & Nav. Co.....	Feb. 302	381,771	62,934	455,940	95,097	95,097	163,715	16,283	386,664	84,800	69,276	4,348
Louisville & Nashville.....	Feb. 302	207,957	29,210	249,944	64,045	33,052	110,070	11,416	226,602	90,600	23,342	30,135
Louisville, Henderson & St. Louis.....	Feb. 343	207,957	29,210	249,944	64,045	33,052	110,070	11,416	226,602	90,600	23,342	30,135
Louisville, Henderson & St. Louis.....	Feb. 343	400,459	60,846	489,144	106,363	70,419	225,665	22,965	442,405	90,400	46,739	50,395
Louisville & Nashville.....	Feb. 5,038	6,998,231	1,650,100	9,078,606	1,402,111	2,306,931	3,653,645	212,759	7,853,938	86,500	1,224,668	988,136
Louisville, Henderson & St. Louis.....	Feb. 5,038	13,511,185	3,374,909	17,678,068	2,825,872	4,593,315	7,412,873	47,726	15,756,698	89,400	1,981,370	1,989,456
Louisville, Henderson & St. Louis.....	Feb. 199	359,788	49,143	209,915	45,644	45,644	75,668	7,887	176,380	81,000	33,635	30,774
Louisville, Henderson & St. Louis.....	Feb. 199	287,701	105,106	413,158	86,962	85,387	155,182	16,194	355,807	86,100	37,351	34,798
Maine Central.....	Feb. 1,215	1,166,919	290,837	1,550,834	219,143	361,154	735,295	40,859	1,366,879	88,100	184,005	200,736
Midland Valley.....	Feb. 1,215	2,272,115	602,085	3,073,446	483,536	667,767	1,486,249	85,458	2,745,577	89,300	327,869	129,723
Midland Valley.....	Feb. 383	257,139	55,871	323,986	39,312	39,665	107,651	13,995	204,573	63,140	119,413	105,974
Minneapolis & St. Louis.....	Feb. 383	502,803	119,557	643,481	83,978	95,164	281,717	28,060	434,144	67,400	209,337	46,992
Minneapolis & St. Louis.....	Feb. 1,649	1,090,640	146,291	1,288,166	161,133	230,322	606,336	40,118	1,062,279	82,500	225,887	132,137
Minneapolis & St. Louis.....	Feb. 1,649	2,166,940	309,453	2,585,494	327,211	469,616	1,213,351	81,183	2,138,645	82,700	446,849	322,182
Minneapolis, St. P. & S. S. Marie.....	Feb. 4,383	1,763,192	498,683	2,427,119	493,107	499,900	1,444,742	102,643	2,600,995	107,200	173,876	211,626
Mississippi Central.....	Feb. 4,383	3,646,353	508,248	5,089,248	777,770	1,334,388	2,922,518	206,070	5,363,833	105,400	274,585	762,703
Missouri, Kansas & Texas.....	Feb. 259	94,409	15,172	113,879	15,909	23,388	41,998	6,784	100,345	88,100	13,534	6,914
Missouri, Kansas & Texas.....	Feb. 265	187,730	32,586	228,854	31,825	66,043	117,723	13,943	207,017	90,500	21,837	7,648
Missouri, Kansas & Texas.....	Feb. 1,670	1,478,392	417,900	2,116,922	176,597	341,413	658,872	94,100	1,329,157	62,800	787,765	9,904
Mo., Kansas & Texas of Texas.....	Feb. 1,670	2,947,166	890,185	4,256,292	448,012	181,787	1,392,722	183,570	3,081,481	72,400	1,174,811	786,001
Mo., Kansas & Texas of Texas.....	Feb. 1,738	1,006,018	370,651	1,510,108	167,256	181,752	641,711	65,877	1,102,450	73,000	407,658	338,657
Wichita Falls & Northwestern.....	Feb. 1,738	2,041,290	799,953	3,093,835	455,697	468,780	1,352,504	143,091	2,521,169	81,500	572,666	116,233
Wichita Falls & Northwestern.....	Feb. 329	82,809	19,276	110,040	15,107	20,759	51,586	9,340	96,410	87,600	13,630	15,457
Wichita Falls & Northwestern.....	Feb. 329	181,529	41,409	239,610	38,659	51,280	105,589	15,597	212,441	88,700	27,169	54,935

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equipment.	Traffic.					
Missouri Pacific	Feb. 7,300	\$5,614,683	\$1,223,801	\$7,420,605	\$1,194,594	\$1,507,302	\$148,383	\$6,299,191	84.90	\$1,121,414	\$730,715	\$3,974
	2 mos. 7,300	11,161,236	2,555,803	14,889,935	2,552,803	3,028,714	303,581	12,819,929	86.10	2,070,006	1,287,882	394,601
Mobile & Ohio	Feb. 1,165	1,081,570	1,24,689	1,268,393	150,614	251,634	37,518	994,412	76.78	273,981	209,824	166,817
	2 mos. 1,165	2,224,577	2,617,955	5,142,532	316,374	546,039	82,144	5,120,152	81.00	497,830	367,962	53,542
Monongahela	Feb. 106	401,852	28,799	436,033	37,634	42,893	1,027	193,050	44.73	240,985	232,985	177,605
	2 mos. 106	737,752	60,305	808,057	82,456	88,840	2,255	393,885	48.83	414,273	396,783	292,990
Monongahela Connecting	Feb. 7	.....	.....	.....	.....	.....	.....	82,419	76.50	2,284	23,297	23,252
	2 mos. 7	.....	.....	.....	19,460	38,077	1,089	153,912	76.60	47,077	43,034	59,153
Montour	Feb. 56	89,185	801	90,652	15,311	31,750	943	79,324	87.50	11,328	8,502	11,793
	2 mos. 56	163,937	1,574	165,511	30,312	63,502	1,915	158,457	94.60	8,977	3,677	19,229
Nashville, Chattanooga & St. Louis	Feb. 1,258	1,064,166	1,501,493	2,565,659	224,260	416,165	66,859	1,932,527	90.60	108,966	73,813	101,888
	2 mos. 1,258	2,053,129	3,003,986	5,057,115	439,572	845,413	135,452	3,782,170	96.50	127,940	32,188	40,799
Nevada Northern	Feb. 165	14,292	3,250	18,890	8,315	4,054	347	22,066	116.80	-3,176	-9,300	-4,402
	2 mos. 165	25,328	6,080	36,270	17,714	8,557	811	46,108	127.10	-9,838	-22,067	-6,611
Newburgh & South Shore	Feb. 7	.....	.....	.....	6,302	30,563	.....	190,264	70.80	78,265	55,616	4,483
	2 mos. 7	.....	.....	.....	11,246	54,798	.....	190,264	70.80	78,265	55,616	4,483
New Orleans & Great Northern	Feb. 274	136,717	31,830	194,261	35,305	77,523	4,632	196,617	101.20	-2,356	-17,411	-27,006
	2 mos. 274	309,065	65,934	388,484	69,538	126,416	9,308	395,234	94.00	23,250	-6,843	-26,704
New York Central	Feb. 6,098	16,127,378	5,838,236	24,612,557	2,552,993	6,359,993	300,245	19,621,786	79.70	4,990,771	3,442,578	3,454,302
	2 mos. 6,098	30,673,455	13,016,114	49,182,905	5,185,213	12,110,949	584,588	39,231,088	79.80	9,951,817	6,866,862	7,056,512
Cincinnati Northern	Feb. 244	279,056	13,379	299,389	39,902	34,984	4,845	188,715	63.00	110,674	88,427	75,238
	2 mos. 244	503,959	29,873	547,075	84,707	80,033	9,691	379,369	69.30	167,706	130,017	98,703
Clev., Cin., Chicago & St. Louis	Feb. 2,415	4,967,063	1,061,659	6,478,725	584,047	1,654,608	97,571	5,036,529	77.70	1,442,196	1,087,165	963,388
	2 mos. 2,415	9,251,912	2,362,033	12,516,845	1,295,611	2,996,846	209,248	10,010,006	80.00	2,506,839	1,846,352	1,534,010
Indiana Harbor Belt	Feb. 119	.....	.....	.....	68,490	46,998	4,373	462,966	63.60	230,510	230,510	140,297
	2 mos. 119	.....	.....	.....	128,391	141,237	7,618	963,495	68.50	444,004	384,378	237,665
Kanawha & Michigan	Feb. 176	283,921	40,738	338,216	36,493	70,486	4,324	243,722	72.10	94,444	67,248	73,860
	2 mos. 176	533,399	86,936	650,357	89,926	169,299	8,277	483,383	81.20	121,974	68,439	98,510
Lake Erie & Western	Feb. 718	643,615	32,206	700,431	106,216	145,874	17,184	595,777	85.10	104,674	59,568	58,871
	2 mos. 718	1,268,059	67,642	1,382,707	213,344	267,572	35,953	1,183,987	85.60	198,720	113,426	113,191
Michigan Central	Feb. 1,862	3,954,056	1,083,113	5,532,241	554,933	1,532,944	94,943	4,426,436	82.00	995,805	770,221	641,726
	2 mos. 1,862	7,276,566	2,504,824	10,009,285	1,182,299	2,677,757	184,859	8,806,436	81.40	2,006,640	1,319,004	476,952
Pittsburg & Lake Erie	Feb. 227	157,467	187,221	344,688	113,435	226,684	17,390	210,354	115.10	-276,039	-354,348	-277,200
	2 mos. 227	306,714	402,286	709,000	221,422	448,578	38,910	418,062	115.80	-571,874	-728,655	-677,458
Toledo & Ohio Central	Feb. 503	761,251	127,754	889,005	106,881	215,251	12,549	687,311	81.50	155,752	100,725	84,999
	2 mos. 503	1,463,865	253,300	1,717,165	227,688	360,128	25,278	1,357,988	83.10	275,483	165,430	170,278
New York, Chicago & St. Louis	Feb. 523	2,147,405	84,035	2,231,440	200,022	392,161	52,878	1,524,951	66.90	754,604	629,505	600,841
	2 mos. 523	4,059,599	162,889	4,243,292	424,563	766,269	107,763	3,187,171	73.90	1,126,119	882,346	644,852
New York, New Haven & Hartford	Feb. 1,986	4,252,660	3,357,090	8,577,023	881,977	1,680,678	51,068	6,855,819	79.90	1,721,204	1,334,000	906,208
	2 mos. 1,986	8,182,056	7,252,289	17,301,526	1,814,432	3,211,855	101,999	13,930,113	80.40	3,398,463	2,623,953	3,654,629
Central New England	Feb. 295	569,011	17,091	586,102	72,486	70,190	5,023	343,213	55.80	271,955	249,882	146,346
	2 mos. 295	1,048,441	36,616	1,143,242	144,293	171,038	9,054	760,283	66.50	382,959	338,822	186,359
New York, Ontario & Western	Feb. 569	719,856	110,192	829,048	87,018	207,217	14,446	801,375	83.50	138,551	120,549	37,007
	2 mos. 569	1,259,103	236,180	1,766,229	188,638	408,735	27,859	1,630,476	92.30	135,753	59,746	-28,549
Norfolk & Western	Feb. 2,237	5,478,697	583,239	6,255,621	818,201	1,486,190	70,572	4,583,607	72.50	1,742,114	1,291,638	1,519,807
	2 mos. 2,237	10,621,860	1,249,494	12,353,292	1,669,604	2,955,517	144,151	9,383,183	75.40	3,035,109	2,133,762	2,509,917
Norfolk Southern	Feb. 930	497,949	95,807	620,240	96,877	91,734	2,208	307,333	83.60	101,834	76,393	54,945
	2 mos. 930	884,249	206,987	1,140,105	194,096	197,141	4,327	559,262	92.60	84,059	33,162	-23,250
Northern Pacific	Feb. 6,556	4,342,706	1,022,993	5,859,499	1,564,467	2,789,474	204,445	5,539,845	94.50	319,664	-438,664	-196,712
	2 mos. 6,556	8,610,828	2,166,337	11,847,325	3,149,586	5,539,845	422,319	11,553,243	97.50	294,082	-1,216,808	-821,275
Northwestern Pacific	Feb. 507	274,388	148,341	475,870	93,775	70,766	4,939	412,324	86.60	63,546	18,331	31,690
	2 mos. 507	551,037	319,343	983,269	198,836	155,519	10,819	872,136	88.70	111,133	20,762	-7,204
Pennsylvania	Feb. 7,323	26,355,515	8,330,007	37,359,660	3,288,128	9,840,996	359,510	29,734,682	79.70	7,574,978	6,753,368	6,394,729
	2 mos. 7,323	50,611,114	18,183,256	74,687,823	6,958,641	19,641,206	862,159	60,636,965	81.20	14,044,848	12,133,051	11,360,817
Balti., Chesapeake & Atlantic	Feb. 87	53,704	1,771	55,475	6,217	23,169	1,408	96,809	147.70	-19,177	-5,751	-18,863
	2 mos. 87	104,423	3,781	118,946	14,875	46,312	2,872	201,671	135.40	-32,725	-5,729	-52,483
Cin., Lebanon & Northern	Feb. 76	44,337	6,845	67,015	9,577	14,514	1,597	79,766	119.00	12,751	-16,154	-15,902
	2 mos. 76	99,957	13,708	144,154	24,226	33,367	3,263	172,770	119.00	-28,616	-36,883	-32,785
Cumberland Valley & Martinsburg	Feb. 33	96,163	5,866	104,369	5,346	16,099	615	55,285	53.00	49,084	45,883	41,769
	2 mos. 33	186,648	12,419	203,558	11,990	33,079	1,577	112,098	55.10	91,460	83,966	75,147
Grand Rapids & Indiana	Feb. 575	402,963	128,497	571,158	176,473	166,431	12,699	621,575	108.80	-50,417	-61,045	-79,520
	2 mos. 575	777,956	296,621	1,159,628	360,621	695,245	24,560	1,267,715	109.30	-108,087	-138,496	-173,933
Long Island	Feb. 398	619,357	1,065,039	1,863,172	208,482	375,431	14,076	1,657,900	89.00	205,272	186,168	131,555
	2 mos. 398	1,215,730	2,208,438	3,784,475	439,888	768,321	29,216	3,410,430	90.10	374,045	313,489	200,531
Maryland, Dela. & Virginia	Feb. 82	41,107	11,405	55,415	4,769	25,365	1,211	83,803	151.20	-28,388	-28,394	-29,896
	2 mos. 82	82,167	25,022	113,373	11,334	43,149	1,709	158,446	141.00	-46,073	-46,079	-49,597
N. Y., Phila. & Norfolk	Feb. 122	421,224	57,933	513,801	40,361	136,012	6,639	476,848	92.80	36,953	29,183	19,114
	2 mos. 122	714,505	129,369	919,599	92,313	286,219	15,745	984,094	107.00	-63,495	-84,095	-106,426

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operations.	Operating (or loss).	Net after rentals.	Net after rentals 1921.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Traffic.	Transit.					
Pitts., Cin., Chi. & St. Louis.....	2,412	\$4,856,587	\$1,367,822	\$6,900,157	\$533,842	\$2,018,738	\$95,353	\$3,049,691	\$2,068,818	\$5,958,401	\$8,068,188	\$5,958,401
2 mos.	2,412	9,448,009	3,057,620	13,883,337	1,092,524	4,044,306	6,202,407	6,202,407	4,207,718	12,095,170	17,888,167	12,095,170
West Jersey & Seashore.....	359	333,510	395,726	794,765	138,718	182,913	11,889	443,303	25,997	814,235	35,997	19,808
2 mos.	359	616,045	765,038	1,515,097	274,839	381,685	29,095	899,515	53,532	1,660,096	109,600	174,935
Peoria & Pekin Union.....	19	17,360	2,926	17,360	9,149	21,472	39	65,626	104,358	104,358	68,040	53,040
2 mos.	19	31,094	5,273	31,094	16,916	44,481	173	133,170	18,524	213,264	128,266	128,266
Pere Marquette	2,222	2,148,298	328,085	2,511,991	223,060	528,639	46,864	1,822,182	107,718	2,097,226	584,755	457,834
2 mos.	2,222	3,988,285	731,931	5,117,091	432,027	988,489	102,012	2,367,300	209,548	4,117,387	999,704	740,951
Philadelphia & Reading.....	1,127	5,946,688	719,366	6,923,568	598,233	1,552,718	51,105	2,537,676	146,208	4,883,208	1,641,367	1,641,367
2 mos.	1,127	10,915,900	1,565,458	13,044,326	1,512,490	3,310,576	111,459	5,037,022	294,970	10,263,235	2,781,091	2,781,091
Atlantic City	176	100,068	109,582	215,099	44,921	35,665	4,253	169,118	3,943	257,205	119,600	119,600
2 mos.	176	193,069	229,635	436,740	99,914	2,185	7,603	339,898	7,900	456,745	20,005	58,525
Perkiomen	41	74,480	6,662	84,419	4,997	3,867	307	42,509	876	52,392	62,100	52,392
2 mos.	41	151,729	14,072	172,046	13,031	8,372	213	88,841	1,811	112,330	128,266	128,266
Port Reading	21	155,453	.....	227,242	20,660	4,816	2,29	65,202	1,278	92,185	40,600	40,600
2 mos.	21	288,102	.....	405,471	35,509	13,605	458	129,368	2,528	181,468	44,800	44,800
Pittsburg & Shawmut.....	102	124,608	5,838	131,342	26,285	29,368	1,527	35,366	8,081	101,127	77,000	77,000
2 mos.	102	218,717	11,659	232,447	54,601	60,282	2,937	68,704	14,707	201,231	166,600	166,600
Pittsburg & West Virginia.....	85	218,341	8,156	257,706	23,070	82,127	2,996	60,494	13,172	190,452	71,900	71,900
2 mos.	85	403,703	17,498	483,378	46,465	180,941	5,687	119,371	25,111	395,726	81,800	81,800
Pittsburg, Shawmut & Northern.....	210	99,106	6,930	108,485	14,010	54,602	1,437	45,043	5,910	121,005	111,500	111,500
2 mos.	210	183,061	14,440	202,954	28,904	83,920	3,626	89,132	17,917	223,275	111,500	111,500
Quincy, Omaha & Kansas City.....	252	51,981	20,992	80,078	40,436	18,013	795	41,619	5,445	106,298	132,700	132,700
2 mos.	252	93,911	42,870	152,895	62,060	35,536	1,709	89,454	3,183	191,414	125,200	125,200
Richmond, Fredericksburg & Potomac.....	117	356,317	289,743	776,431	70,411	108,870	8,165	304,143	26,174	541,082	69,700	69,700
2 mos.	117	651,108	619,949	1,527,588	153,312	219,958	15,437	511,414	52,001	1,093,577	71,700	71,700
Rutland	415	255,558	102,674	424,507	82,370	177,357	7,859	211,500	12,501	396,948	94,000	94,000
2 mos.	415	465,126	226,697	834,373	171,004	177,357	16,599	434,477	26,008	828,763	99,300	99,300
St. Louis-San Francisco.....	4,760	4,186,085	1,242,959	5,819,865	631,207	1,151,166	71,385	2,226,723	180,847	4,237,799	72,800	72,800
2 mos.	4,760	8,204,092	2,643,923	11,700,998	1,315,532	2,258,616	155,886	4,604,904	382,987	8,683,159	74,200	74,200
Ft. Worth & Rio Grande.....	235	61,362	22,661	93,933	24,428	31,367	2,661	50,347	5,022	121,871	131,000	131,000
2 mos.	235	130,715	49,683	198,277	80,547	43,306	5,359	103,618	11,231	243,206	122,600	122,600
St. Louis, San Francisco & Tex.....	134	100,318	13,303	119,454	28,441	18,037	3,724	53,572	6,480	109,411	91,600	91,600
2 mos.	134	219,279	28,250	257,529	55,740	40,110	6,592	109,381	13,067	233,249	90,300	90,300
St. Louis-Southwestern	968	1,067,454	121,860	1,235,351	217,434	190,448	42,672	363,185	52,138	843,513	68,100	68,100
2 mos.	968	2,011,152	259,270	2,555,358	441,657	400,723	88,944	690,721	106,528	1,738,633	68,100	68,100
St. Louis Southwestern of Tex.....	807	415,844	79,105	526,597	141,317	144,770	19,116	283,450	29,183	618,583	117,500	117,500
2 mos.	807	916,485	171,136	1,150,110	303,875	307,817	38,874	605,602	60,733	1,317,982	114,600	114,600
San Antonio & Aransas Pass.....	739	314,301	52,210	388,790	100,378	100,378	9,905	189,439	25,516	410,106	105,400	105,400
2 mos.	739	593,144	115,333	753,599	181,101	211,819	19,075	389,441	50,248	851,031	112,900	112,900
San Antonio, Uvalde & Gulf.....	317	45,640	14,541	66,259	10,248	10,262	2,857	29,899	6,237	59,503	89,800	89,800
2 mos.	317	87,687	32,400	125,083	24,219	20,577	5,484	61,542	12,677	124,499	94,300	94,300
Seaboard Air Line.....	3,563	2,355,908	812,303	3,409,246	398,121	663,080	106,773	1,565,201	147,511	2,925,975	85,800	85,800
2 mos.	3,563	4,632,690	1,811,239	6,997,815	849,803	1,298,995	233,389	3,173,709	292,120	5,917,693	84,600	84,600
Southern	6,971	6,305,982	2,036,258	9,019,687	1,393,798	1,721,203	199,340	3,824,908	312,076	7,527,984	83,500	83,500
2 mos.	6,971	12,357,843	4,480,450	18,237,219	2,651,226	3,438,000	403,414	8,007,228	638,518	15,290,253	83,800	83,800
Alabama Great Southern.....	313	508,599	113,414	655,982	83,540	118,839	21,316	274,086	23,600	527,212	80,400	80,400
2 mos.	313	1,012,788	249,850	1,329,400	161,695	268,280	42,247	583,671	49,106	1,117,528	84,100	84,100
Cin., New Orleans & Tex. Pacific.....	338	971,531	235,950	1,261,953	145,448	328,304	28,417	449,722	38,209	1,001,044	79,300	79,300
2 mos.	338	1,884,017	562,597	2,566,559	275,901	639,467	56,849	935,366	79,663	2,008,360	78,300	78,300
Georgia, Southern & Florida.....	402	223,478	84,306	337,019	66,931	57,924	7,875	169,940	11,540	317,201	94,100	94,100
2 mos.	402	490,534	198,108	748,765	124,787	127,793	16,779	343,639	24,408	643,838	86,000	86,000
New Orleans & Northwestern.....	207	364,025	68,132	473,305	71,283	90,182	11,985	216,113	16,681	409,995	86,600	86,600
2 mos.	207	735,768	143,982	964,066	134,715	184,771	23,920	461,673	35,757	848,556	88,000	88,000
Northern Alabama	110	71,175	9,830	82,921	16,185	4,774	1,128	32,591	2,472	57,150	68,900	68,900
2 mos.	110	142,600	21,138	167,987	32,151	9,222	2,988	70,367	5,851	120,573	71,900	71,900
Southern Pacific	7,119	7,336,407	3,046,115	11,363,771	1,884,214	2,266,959	220,740	4,419,246	393,116	9,437,691	83,100	83,100
2 mos.	7,119	13,181,240	6,432,093	23,793,506	4,783,269	5,786,862	9,218,549	9,218,549	835,214	19,417,857	82,500	82,500
Arizona Eastern	382	163,335	28,314	200,567	23,270	24,657	2,502	61,481	20,046	132,371	66,000	66,000
2 mos.	382	308,971	55,945	382,952	52,772	50,353	5,251	125,002	43,917	277,985	72,600	72,600

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of way and structures.	Equip-ment.	Traffic.				
Atlantic S. S. Lines.....	Feb. 923	\$901,985	\$52,613	\$954,598	\$10,175	\$156,783	\$15,658	76.80	\$231,121	\$219,238	\$56,242
Gal., Harrisburg & San Ant.....	2 mos. 1,701,193	99,586	1,888,314	1,987,900	20,386	286,991	30,263	78.80	390,726	375,022	35,802
Gal., Harrisburg & San Ant.....	Feb. 1,379	2,227,288	334,171	2,561,459	316,841	295,181	38,634	83.20	295,226	242,808	44,864
Houston & Texas Central.....	2 mos. 1,379	2,397,061	328,549	2,725,610	635,320	634,173	1,364,810	87.80	241,504	296,837	43,873
Houston East & West Tex.....	Feb. 923	754,658	275,436	1,030,094	207,837	206,533	21,654	81.30	203,959	159,188	127,588
Houston East & West Tex.....	2 mos. 923	1,791,845	591,367	2,383,212	408,926	438,042	45,992	76.20	596,014	506,737	67,502
Houston East & West Tex.....	Feb. 191	1,672,728	34,398	1,707,126	43,757	43,227	94,850	9.10	16,741	9,127	4,812
Houston East & West Tex.....	2 mos. 191	335,005	70,959	405,964	92,624	99,535	6,705	95.70	5,466	9,686	21,568
Louisiana Western.....	Feb. 307	271,054	81,213	352,267	67,682	72,010	96,956	71.70	105,945	77,965	76,730
Morgan's La. & T. R. R. & S. Co. Feb. 400	2 mos. 307	505,099	171,540	676,639	137,481	137,481	208,824	75.10	178,778	123,251	116,573
Morgan's La. & T. R. R. & S. Co. Feb. 400	2 mos. 400	435,445	145,842	581,287	134,552	149,669	161,577	94.00	37,327	8,211	26,895
Morgan's La. & T. R. R. & S. Co. Feb. 400	2 mos. 400	847,518	300,472	1,147,990	273,750	303,302	526,557	98.20	1,213,750	65,497	1,011,726
Texas & New Orleans.....	Feb. 507	543,295	140,499	683,794	149,288	167,922	11,133	86.70	95,688	71,339	38,721
Spokane International.....	2 mos. 507	1,176,217	292,240	1,468,457	265,262	343,952	24,252	81.20	291,657	242,920	123,526
Spokane International.....	Feb. 165	68,498	8,335	76,833	8,456	7,227	3,225	75.50	19,644	14,161	5,560
Spokane International.....	2 mos. 165	145,894	17,716	163,610	18,065	14,055	6,445	73.70	45,008	34,050	18,837
Spokane, Portland & Seattle.....	Feb. 549	341,983	105,781	447,764	45,907	77,683	8,777	68.70	152,157	68,031	62,885
Tennessee Central.....	2 mos. 549	706,547	225,033	931,580	94,237	175,691	16,446	70.20	303,955	135,707	132,520
Tennessee Central.....	Feb. 292	127,254	34,702	161,956	22,773	24,479	4,483	82.90	29,945	25,921	10,565
Tennessee Central.....	2 mos. 292	242,503	75,213	317,716	63,830	67,803	9,701	96.20	12,907	4,800	25,079
Term. R. R. Assn. of St. Louis.....	Feb. 37	.....	.....	362,718	56,832	34,111	1,028	61.40	139,823	84,461	196,773
East St. Louis Connecting.....	2 mos. 37	.....	.....	131,302	126,466	70,566	2,020	62.80	280,797	170,045	396,570
East St. Louis Connecting.....	Feb. 1	.....	.....	263,115	25,092	11,942	635	58.80	54,063	49,009	41,220
St. Louis Mchts. Bridge Term.....	2 mos. 9	.....	.....	311,255	36,811	22,913	142,872	66.30	104,897	88,848	106,640
St. Louis Transfer.....	2 mos. 9	.....	.....	105,000	81,016	40,341	1,861	69.50	188,039	156,155	195,215
St. Louis Transfer.....	Feb. 6	.....	.....	212,087	19,176	6,941	370	45.10	57,651	56,687	31,686
Texas & Pacific.....	2 mos. 9	.....	.....	1,563,384	2,237,907	381,938	45,078	46.50	113,489	111,582	91,727
Toledo, Peoria & Western.....	Feb. 1,952	3,355,386	1,134,067	4,489,453	821,618	1,021,038	92,101	84.70	342,276	217,146	134,553
Toledo, Peoria & Western.....	2 mos. 1,952	96,529	42,311	138,840	19,857	31,312	7,093	85.10	717,256	467,012	258,457
Toledo, Peoria & Western.....	2 mos. 247	167,191	86,862	254,053	42,276	72,565	5,584	88.30	17,125	7,045	1,126
Toledo, St. Louis & Western.....	Feb. 454	682,591	21,011	703,602	80,061	126,420	20,071	104.20	11,417	31,501	39,820
Trinity and Brazos Valley.....	2 mos. 454	1,346,586	46,393	1,392,979	145,468	260,324	40,964	65.90	250,643	204,643	179,267
Union of Pa.....	Feb. 368	294,017	20,635	314,652	72,898	57,362	2,983	68.00	465,589	373,086	373,823
Union of Pa.....	2 mos. 368	720,116	44,942	765,058	181,103	137,973	6,356	77.00	174,290	160,275	18,037
Union Pacific.....	Feb. 128	43,112	17,876	60,988	15,889	18,265	1,850	78.00	174,290	160,275	25,618
Union Pacific.....	2 mos. 128	82,335	38,848	121,183	32,154	42,206	3,693	114.30	11,879	18,118	32,165
Union Pacific.....	Feb. 45	.....	.....	646,296	40,258	160,802	156	118.80	32,018	44,260	48,950
Union Pacific.....	2 mos. 45	.....	.....	1,306,995	95,384	322,615	358	79.10	135,151	122,151	188,304
Union Pacific.....	2 mos. 45	.....	.....	.....	.....	.....	.....	80.50	235,266	229,266	347,270
Oregon Short Line.....	Feb. 3,665	5,269,234	1,048,229	6,317,463	947,254	1,506,804	306,741	69.02	2,155,420	1,587,672	1,560,886
Oregon Short Line.....	2 mos. 3,665	10,249,862	2,270,720	12,520,582	3,040,478	3,040,478	618,799	72.03	3,851,905	2,717,066	2,619,950
Oregon Short Line.....	Feb. 2,359	2,046,450	349,564	2,396,014	286,301	291,233	113,078	73.10	720,700	446,359	420,943
Oregon Short Line.....	2 mos. 2,359	4,036,833	744,721	4,781,554	555,071	1,026,657	238,216	73.70	1,354,719	804,360	749,269
Oregon, Wash. R. R. & Nav.....	Feb. 2,218	1,423,246	363,205	1,786,451	304,681	375,847	54,947	93.02	135,637	45,325	122,310
Oregon, Wash. R. R. & Nav.....	2 mos. 2,218	2,991,878	767,604	3,759,482	579,980	771,993	112,006	92.40	302,890	59,703	219,311
Oregon, Wash. R. R. & Nav.....	Feb. 258	204,122	22,663	226,785	28,029	44,249	2,781	83.60	70,832	21,265	16,885
Oregon, Wash. R. R. & Nav.....	2 mos. 258	402,190	45,931	448,121	53,466	87,292	5,392	83.00	70,832	35,240	26,592
Utah.....	Feb. 104	138,738	924	139,662	10,164	37,043	359	60.80	55,203	48,434	35,728
Utah.....	2 mos. 104	243,968	1,694	245,662	22,083	66,902	679	66.90	81,785	68,425	42,618
Virginian.....	Feb. 526	1,387,581	56,183	1,443,764	153,133	159,505	12,002	58.90	632,340	535,979	554,839
Virginian.....	2 mos. 526	2,652,481	118,777	2,771,258	334,946	371,203	24,531	61.20	1,144,043	946,035	973,499
Wabash.....	Feb. 2,472	3,678,132	590,235	4,268,367	554,342	862,380	140,375	81.40	845,030	656,316	401,241
Wabash.....	2 mos. 2,472	7,043,075	1,271,439	8,314,514	1,153,325	1,788,101	229,272	84.70	1,352,649	975,038	471,291
Western Maryland.....	Feb. 804	1,316,157	67,623	1,383,780	206,663	265,848	28,473	74.40	385,074	375,074	268,818
Western Maryland.....	2 mos. 804	2,622,693	144,882	2,767,575	401,866	569,797	56,584	74.70	734,968	654,968	468,389
Western Pacific.....	Feb. 1,042	601,397	86,445	687,842	119,277	164,518	28,574	99.40	4,252	81,868	57,238
Western Pacific.....	2 mos. 1,042	1,221,628	208,861	1,430,489	312,438	396,217	56,958	92.10	121,250	121,250	7,846
Wheeling & Lake Erie.....	Feb. 511	961,172	60,042	1,021,214	119,361	225,245	38,435	73.80	278,506	180,430	140,751
Wheeling & Lake Erie.....	2 mos. 511	1,788,228	131,013	1,919,241	248,018	351,913	35,767	77.40	458,516	270,400	201,835
Akron, Canton & Youngstown.....	Feb. 170	151,298	1,257	152,555	18,121	18,121	5,618	54.00	73,106	64,106	48,018
Akron, Canton & Youngstown.....	2 mos. 170	299,133	2,688	301,821	35,334	35,334	10,916	55.00	141,476	123,476	91,222

Annual Meeting of Signal Section

H. S. Balliet, secretary, 30 Vesey street, New York, announces the tenth meeting of the Signal Section, American Railway Association to be held at the Monmouth Hotel, Spring Lake, N. J., on Wednesday, Thursday and Friday, June 14, 15 and 16. The reports of committees are contained in the advance notice which will be mailed May 22. Hotel reservations should be made direct with the hotel management. Rates, on the American plan, range from \$8 a day for single rooms without bath to \$18, \$20 and \$22 for double room with bath. The stipulation for occupancy of rooms is one person to a single room and two people to a double room. Members who desire to remain at the hotel beyond the convention period will be accommodated at the same rates until the evening of June 18. Spring Lake is reached from New York by the Pennsylvania or the Central of New Jersey, in eighty minutes, with fast train service about every hour.

Report of Pennsylvania Reviewing Committees

The reviewing committees of the Pennsylvania Railroad—committees composed of officers of the road and representatives of the employees brotherhoods—who consider controversies between the company and its employees, have during the year ending December 31 last, considered 6,196 cases, of which 3,729 were adjusted or compromised in favor of the employees; 2,314 cases were withdrawn and 43 were decided in favor of the management. The remaining 110 cases, equal to two per cent of the total, were either dropped, pending appeal, or were brought up at a later date in some other shape. The cases decided in favor of the employees equaled 60 per cent of the whole; the cases withdrawn, with those decided in favor of the management equaled 37.94 per cent. The committees which deal with complaints of engine and train service employees have been in existence since January 1, 1921, but those which deal with the other classes of employees were not established until August or September.

Of the 3,729 cases settled in favor of the employees, 1,409 were decided by officers below the grade of superintendent; 1,935 were settled by superintendents; 258 by general superintendents; 99 by general managers and 28 by reviewing committees.

Accident Bulletin No. 81

The Interstate Commerce Commission has issued quarterly accident bulletin No. 81, dated February 8, giving statistics of railroad accidents occurring in the United States in the three months ending with September, 1921. During this quarter 11 passengers, 51 employees and 21 other persons were killed in train accidents, and 900 passengers, 338 employees and 62 other persons were injured; a total of 83 persons killed and 1,300 injured.

Adding train service accidents, the total number of casualties occurring in train operation was as follows: passengers killed 46, employees killed 302, other persons killed 1,331; passengers injured 1,992, employees injured 7,236, other persons injured 2,508; a total of 1,679 killed and 11,666 injured. As compared with the corresponding quarter in 1920, (Bulletin No. 77) all items show a decrease. The total number of persons killed in the earlier quarter was 2,044 and of injured 1,947.

Of passengers killed in train accidents the total this year, 11, compares with 24 in Bulletin No. 77. Under the head of employees killed in train accidents the diminution is 59.5 per cent, the total last year having been 126. The nontrain accidents now reported total 119 killed and 20,997 injured, as compared with totals in the same quarter of 1920 of 124 killed and 29,057.

Southern Pacific Will Send Enginemen to Fuel Association Convention

Eleven engineers and eleven firemen from the Southern Pacific Lines, together with several officers of the road, will be sent to the convention of the International Railway Fuel Association to be held in Chicago, April 22 to 25, as a recognition for maintaining an excellent fuel record during the past twelve months. Individual fuel performance records are kept on the Southern Pacific for each engineer, fireman, and locomotive, and by means of these records the most efficient enginemen are selected. Competition throughout the year has been keen and interest has been maintained through the publication of an honor roll each month showing the engineer and fireman making the best fuel performance

in through freight, local freight, through passenger and local passenger service.

In order to arouse the interest of all employees on the different divisions, a fuel conservation banner made of silk, suitably inscribed and trimmed with gold braid and tassels, is awarded to the division making the best fuel performance for a three-months period. The winning division is indicated by a gold lettered strip which is fastened on the bottom of the banner on which the winning date, as well as superintendent's name, is shown. Gold hat badges are awarded to the engineer and fireman who make the best showing in fuel economy for each three-months period. The Southern Pacific has rewarded enginemen who made unusually good fuel records with a trip to the convention in previous years and the continuation of this practice indicates that the results of attendance at the sessions of the Fuel Association have been found beneficial.

Reparation During Federal Control

The Interstate Commerce Commission has issued a decision holding that the question whether reparation should be awarded on the same basis in respect of transportation during federal control before and after June 25, 1918, depends upon the facts of record in each case.

This proceeding was instituted upon the commission's own motion to afford interested parties an opportunity to argue orally the question whether, in finding unreasonable the rates charged by the director general on traffic which moved during federal control, and in awarding reparation therefor, it should apply a lower basis to shipments made prior to June 25, 1918, when rates were increased approximately 25 per cent, than on shipments made on or after that date.

The position of the director general was that the commission should adopt a uniform rule based upon the principle that any rate found unreasonable on such shipments made prior to June 25 should include the general increase effective on that date because the increase in wages of railroad employees was made retroactive to the beginning of federal control on January 1, 1918, and because railway materials and other expenses had substantially increased before the increase in rates was operative. In this respect he asked that consideration be given to the fact that although certain economies were instituted as an incident of federal control there was a deficit in operating results for the period from January 1 to June 24, 1918. His position was that if, in awarding reparation against him, the same basis is not applied on shipments made prior to June 25 as on shipments thereafter, the effect is to penalize the government for having failed to initiate at an earlier stage of federal control the increased rates which would doubtless have been found reasonable.

The report, by Commissioner Hall, says in part: "Shippers urge that the rule suggested by the director general is unsound and if adopted would bring about anomalous situations. In *Sulzberger & Sons Co. v. C., R. I. & P.*, 55 I. C. C. 691, the complaint was filed in 1916. The decision was in 1919. If the reasonable maximum rates there prescribed had been established prior to June 25, 1918, they would have been subject to the general increase of that date. Can it be said that because a case is decided after June 25 the fact that rates prior to that date were on a different level should be disregarded? The director general asks in effect that, where particular rates are found unreasonable after June 25 on shipments which moved during federal control both before and after that date, we arbitrarily use January 1, 1918, as the dividing line because the retroactive application to January 1 of the wage award substantially increased the operating expenses during the ensuing period down to June 25, although operating revenues were not increased until the latter date. That is another way of saying that the increases effective on June 25 should be applied retroactively to January 1, 1918, in so far as affecting complaints. If that contention is sound as applied to the director general it is likewise sound as applied to the corporate carriers. Their rates were increased on August 26, 1920, and, as the wage award of July, 1920, was applied retroactively to May 1, 1920, the question would arise in determining the reasonableness of rates on shipments made prior to August 26, 1920, whether any rate, found to have been unreasonable prior to that date may nevertheless properly include the percentage increase authorized in that case. Shippers might with equal propriety ask that general reductions apply retroactively.

"The fact that in some of the decided cases we have awarded reparation to the same basis upon shipments made before and after June 25, 1918, does not necessarily reflect any variance in principle. Operating conditions prior to June 25, 1918, including the retroactive application of the wage award, were important factors, but they were not necessarily controlling in determining the reasonableness of rates after January 1 of that year. Unconsciously, it may be, but none the less really, counsel for the director general asks us to decide cases in advance by laying down some principle of determination which will be controlling before we know anything about the state of facts to which it will be applied. We are convinced that we would not be warranted in announcing any rule of general application as a basis for determining the reasonableness of rates exacted on shipments moving before or after June 25, 1918, or any other date. We are equally convinced that in proceedings against the director general, as in all others, we must adhere to the sound and salutary principle that whether and to what extent a rate was or is unjust or unreasonable in a particular case is a question of fact, to be determined by the exercise of good judgment, informed by experience, in the light of all the pertinent facts of record in that case."

Cogary Cogs

The above title is not so cryptic as it seems. It is the name of a quarterly magazine which has been started by the Central of Georgia Railway Clerks' Organization, to enable the clerks in the operating, accounting and mechanical departments, and in the station agencies, to keep in touch with each other. The clerks recognize that they are only cogs in the railroad machine, but they mean to demonstrate the importance of having every such member exactly fitted for its duty. They forgot to put into the magazine the name of the editor or of the city where it is printed; but we will assume that Savannah is the place.

Railroad Earnings for February

Reports filed with the Interstate Commerce Commission show that the Class I railroads of the United States had a net operating income in February of \$47,762,600, which, on the basis of their tentative valuation, would be at the annual rate of return of 4.57 per cent, compared with an operating deficit during the same month last year of \$5,176,867. This was short \$14,884,000 of the amount necessary to have enabled the carriers to earn a 6 per cent return. In January their net operating income was \$29,476,000 or at the annual return of 2.69 per cent on their tentative valuation.

Operating revenues amounted to \$401,328,700, a decrease of 1.3 per cent as compared with last year, while operating expenses totaled \$324,423,800, 15.6 per cent below those for February, 1921. Virtually complete reports filed with the commission showed that the railroads in February handled approximately 14 per cent more freight than they did during that month last year.

The carriers in the Eastern district in February had operating revenues of \$204,382,100, an increase of 5 per cent, while their operating expenses totaled \$162,328,700, a reduction of 15.1 per cent. Their net operating income was \$29,535,800 compared with an operating deficit of \$7,627,592 the year before. The net operating income for the month was at the annual rate of return of 7.17 per cent on the tentative valuation, exceeding by \$4,833,000 a 6 per cent return.

The railroads in the Southern district had operating revenues of \$53,024,800, a decrease of 3.6 per cent. Operating expenses totaled \$42,225,800, a reduction of 17.7 per cent, while their net operating income was \$7,048,800, compared with \$466,257 during the previous February. This was at the annual rate of return of 3.98 per cent but \$3,584,630 below a 6 per cent return on their tentative valuation.

With the Green Bay & Western alone missing, the operating revenues for the carriers in the Western district amounted to \$143,921,700, a reduction of 8.2 per cent, while their operating expenses totaled \$119,869,100, a decrease of 15.6 per cent. Their net operating income totaled \$11,177,900 compared with \$1,984,468 in February, 1921. This amount, which is at the annual rate of return of only 2.46 per cent, fell \$16,133,000 short of the amount contemplated to be earned under the transportation act.

Traffic News

The Ann Arbor Railroad resumed its car ferry service between Frankfort, Mich., and Menominee, on April 5.

The Chicago & North Western and the Union Pacific have opened a joint ticket office at 37 Plural street, Council Bluffs, Iowa.

The Great Northern has announced its intention to inaugurate Pullman sleeping car service on its lines next month. Heretofore this company has furnished its own sleeping car equipment.

The Wabash has announced a reduction in fares from Chicago to New York, similar to that of the Erie, effective April 17. The round trip fare will be \$43, with stop-over privileges at Detroit, Buffalo and Niagara Falls.

The Erie has announced a 30 per cent reduction in its round trip fare from Chicago to New York, to be effective April 17. The tickets will be good for one week with certain stop-over privileges. The reduction is from \$61.40 to \$43.

The House committee on interstate and foreign commerce, which recently completed a series of hearings on various bills to require the use of interchangeable mileage books at reduced rates, has postponed any further consideration of these various bills until May 2.

The Chicago & North Western has announced week-end excursion fares from Chicago to points in Central Wisconsin to be effective from May 15 to October 1. The fares will be on a basis of 2.7 cents a mile. Tickets will be valid between Friday and Monday mornings, within 30 days.

The Canadian Pacific has announced a reduction of 5½ cents per 100 lb. on grain to be consumed at destination (domestic consumption) and one cent per 100 lb. on grain for export, applicable between the head of the Great Lakes and points in eastern Canada and eastern United States. The reduction in export rates goes into effect on April 20, and in domestic rates on April 29.

The Spokane, Portland & Seattle has announced that effective May 18, it will establish proportional rates of forest products from Pacific Coast and interior points as shown in tariff 18-D, applicable on traffic destined to the lake ports of Michigan, also to Ohio, Pennsylvania and New York or beyond. The reductions on the various commodities will be as follows: shingles from the coast 5½ cents, and from interior points 4½ cents; fir lumber, from the coast 5½ cents, and from interior 4½ cents.

R. C. Dearborn, whose appointment as chairman of the National Perishable Freight Committee, with headquarters at Chicago, to succeed E. S. Briggs, was announced in the *Railway Age* of March 18, was born in Yorkville, Ill., on August 8, 1877. He became a stenographer on the Michigan Central in 1900 following a period of service in the employ of the North Shore Dispatch and later in the general freight office of the Michigan Central at Chicago. In 1902 he was employed by the Santa Fe Refrigerator Dispatch Company, where he remained for a year, when he became associated with the Fruit Growers' Express, with which company he served until 1907. With its successor, the Pacific Fruit Express, he served as chief clerk and general agent until July 1, 1920, when he was appointed traffic manager, the position he held at the time of his recent appointment.

At the annual meeting of the Chicago Traffic Club, held on March 28, the following officers were elected for the ensuing year: President, J. A. Brough, traffic manager, Crane Company; first vice-president, E. K. Fleming, general agent, Chicago, Burlington & Quincy; second vice-president, C. E. Barnes, warehouse department, Peter Schoenhofen Brewing Company; third vice-president, E. L. Whitney, assistant general freight agent, New York Central; treasurer, R. J. Wallace, traffic manager, Jaques

Manufacturing Company; secretary, E. S. Buckmaster, assistant general agent, American Railway Express. Directors: H. H. Bascom, traffic manager, Steel & Tube Company of America; B. S. Garvey, vice-president of the Illinois Bell Telephone Company; J. F. Coykendall, treasurer, Chicago Great Western; and the retiring president, R. B. Robertson, assistant freight traffic manager, Union Pacific.

To Investigate Western Coal Rates

Considerable dissatisfaction having been manifested against the rates on bituminous coal in the western part of the United States, the Interstate Commerce Commission has concluded to institute an investigation into all such rates from producing points in Montana, Wyoming, Colorado, New Mexico and all states west thereof to destinations in those states and to El Paso, Tex. To afford all interested parties an opportunity to be heard hearings will be held in May at representative points, including Denver, Salt Lake City, Butte, Seattle, San Francisco, Phoenix, and El Paso. In so far as practicable it is desired that rates to points in Colorado be considered at the hearing at Denver, to points in Utah at Salt Lake City, to points in Montana and Idaho at Butte or Salt Lake City, to points in Washington and Oregon at Seattle, to points in Nevada and California at San Francisco, and to points in Arizona and New Mexico at Phoenix or El Paso.

Traffic Statistics for January

Class 1 railroads in January handled 23,682,356,000 ton-miles of revenue freight, as compared with 26,627,393,000 in January, 1921, according to the Interstate Commerce Commission monthly bulletin of revenue traffic statistics. The average revenue per ton-mile was 1.164 cents as against 1.215 last year and the average haul per road was 198.67 miles as against 188.11. The number of passenger miles for the month was also less than in January last year, 2,698,888,000, as against 3,378,782,000. The average revenue per passenger-mile was 3.102 cents as against 3.114 and the average journey per road 33.21 as against 35.69. The average number of revenue passengers per car was 14.54 as against 17.11.

The number of revenue passenger-miles in commutation service was 511,373,000 and the commutation revenue was \$5,726,063. As indicating how the average revenue and the average journey per passenger were reduced by commutation service and rates, the bulletin shows that the average journey in commutation service was 13.87 miles, while the average in other service was 49.26 miles. The average revenue per passenger-mile in commutation service was 1.12 cents and in other service 3.565 cents.

Anthracite Shipments—March, 1922

The shipments of anthracite for March, 1922, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,778,667 gross tons, an increase over the preceding month of February of 1,539,653 gross tons, and over the month of March last year of 1,040,896 gross tons.

March, 1922, stands third as a record for that month, shipments in excess of this figure being made during the years when the anthracite industry reached the high water mark, a record of 7,276,777 gross tons being established in March, 1918, and 6,989,075 gross tons in March, 1917.

The total shipments for the coal year ending March 31, 1922, have amounted to 67,039,037 gross tons, as compared with 69,366,731 gross tons shipped during the previous coal year ending March 31, 1921, a decrease of approximately 2,300,000 gross tons. Shipments by originating carriers were as follows:

	March, 1922	March, 1921	Coal Year 1921-1922	Coal Year 1920-1921
P. & R.....	1,372,024	1,018,858	13,319,886	13,952,192
L. V.	1,220,563	1,022,714	11,647,083	12,580,764
C. of N. J.	654,679	540,556	6,632,425	5,674,767
D. L. & W.	1,047,622	1,020,381	10,218,329	10,140,295
D. & H.	909,261	837,644	8,998,519	10,195,735
Pennsylvania R. R.	523,273	333,687	4,927,204	5,240,868
Erie	654,492	561,013	6,881,690	6,504,683
N. Y. O. & W.	154,681	144,930	1,548,303	1,999,761
L. & N. E.	242,072	257,988	2,865,598	3,077,666
	6,778,667	5,737,771	67,039,037	69,366,731

Commission and Court News

Interstate Commerce Commission

The commission has suspended until July 30 the operation of schedules published by the Illinois Central which propose reduced rates on coal from Illinois mines on the Illinois Central to points on the St. Louis Southwestern, the present rates ranging from \$4.60 to \$4.94 per net ton while the proposed rate to all the stations is \$4.45½.

The commission has suspended from April 5 to August 3 the operation of schedules which propose changes in routing of shipments of grain, grain products, cereals and cereal products, carloads, on traffic originating in Colorado, Iowa, Kansas, Missouri, Nebraska, Oklahoma and Wyoming, destined to Arizona, California, Mexico, Nevada, New Mexico, Oregon and Utah.

The Interstate Commerce Commission on April 7, vacated its order advancing intrastate rates in Indiana because the Indiana commission had withdrawn on April 4, its order which had prevented the railroads from making effective as to intrastate rates the increases ordered by the federal commission in Ex-Parte 74, until the federal commission issued the intrastate rate order.

The commission has suspended to August 8, the operation of schedules published by the Chicago & North Western and the Chicago, Milwaukee & St. Paul, which propose new joint and proportional reshipping rates on wheat, corn and other grains from Chicago in connection with those roads to Milwaukee, Wis., thence by car ferry in connection with the Grand Trunk and the Pere Marquette to eastern cities, on both domestic and export traffic, which are the same as the reshipping rates, currently in effect from Chicago, in connection with eastern lines and from Milwaukee, when routing via Chicago, or by car ferry across Lake Michigan.

The Commerce Commission has issued a notice to all railroads saying that for some time it has been receiving very many requests for a waiver of that portion of section 6 of the act, which requires changes in rates to be established on not less than 30 days' notice. Because of the relationships which exist in rates between points and between commodities, the establishment of rates on short notice frequently results in discrimination and necessitates the filing of additional applications. The purpose of the notice is to advise all concerned that the commission will not approve the establishment of changes in rates on less than statutory notice unless carriers make in their applications a substantial showing of an emergency which warrants the waiver of statutory notice, nor will the commission, under any circumstances, approve an application for waiver of statutory notice, which application covers only a portion of an adjustment and gives no heed to similar changes in rates at related points or on related commodities. Administrative ruling No. 58 of tariff circular No. 18-A has been amended in line with the foregoing.

State Commissions

The Public Service Commission of New York has issued an order, to go into effect at once, calling for a reduction in the rates for the transfer of baggage in New York City. The Commission has revised the zones under which the baggage transfer companies have worked for many years and has reduced most of the rates. In the center of the city—Manhattan, south of 59th street—the rate is \$1 for each trunk and 75 cents for each bag. Hitherto the charges have been \$1.25 for a trunk and 90 cents for a bag. On commercial trunks the rate may be 15 cents (each) higher than the scale for ordinary trunks; and on baggage taken by the wagonload of not less than 20 trunks, the rate will be 30 per cent less than the normal tariff. Under the order the Westcott Express Company and the New York Express Company are required to report to the commissioner monthly.

showing the number of pieces of baggage handled in and between the zones with a statement of operating expenses; also withdrawals from and additions to their capital accounts. The order evidently leaves open the question of further and more detailed investigation of the reasonableness of these rates.

Photographs on Commutation Tickets

The New York Public Service Commission holds in the case of *Crosby v. New York Central* that a requirement that a commutation ticket for exclusive use of the purchaser is valid only when presented with a holder containing the purchaser's photograph and signature is reasonable, not discriminatory and not in violation of the legal tender act as requiring the tender of value in addition to the price of the ticket.—Decided December 14, 1921.

Personnel of Commissions

The Senate on April 11 confirmed the President's appointments of G. W. W. Hanger, J. H. Elliott and A. O. Wharton as members of the Railroad Labor Board for a five-year term.

Charles D. Mahaffie, an attorney in the Law Department of the United States Railroad Administration, with office at Washington, D. C., has been appointed director of the Bureau of Finance of the Interstate Commerce Commission, effective on May 1, succeeding W. A. Colston, who has resigned to become vice-president and general counsel of the New York, Chicago & St. Louis. Mr. Mahaffie is 37 years of age and has been with the Railroad Administration since July 1, 1921, having formerly been solicitor for the Interior Department from 1916 to that date. From 1909 to 1916 he was engaged in the practice of law at Portland, Ore.

Court News

Negligent Cause of Damage to Live

Stock Must Be Proved

The mere fact that hogs, apparently sound when delivered for shipment, arrive at their destination sick with pneumonia, does not raise a presumption that the railroad has been guilty of negligence which caused it. This might have been caused by inherent weakness or infirmity of the animals. Nor is the railroad chargeable with delay in unloading the hogs due to congestion of cars at the stockyards, or other causes beyond its control.—*Bragg v. Payne* (Mo. App.), 235 S. W., 148.

Cotton Not in Possession of Carrier, as Carrier, Until Shipping Directions Are Given

Cotton was destroyed by fire after it had been loaded on cars by a compress company at the owner's request. The loading certificate issued by the compress company was held by the owners, who had given no shipping directions and had made no application for bill of lading. In an action by the owners the Circuit Court of Appeals, Fifth Circuit, holds that the defendant railroad was not in possession of the cotton as a common carrier, and was therefore not liable for its loss.—*Harris, Cortner & Co. v. L. & N.*, 276 Fed. 277.

Defect in Hand Brake Must Cause Injury to Warrant Recovery

In an action for the death of a man employed by a street railway company to unload coal from cars received from defendant, the Chicago, Burlington & Quincy, who was killed while riding a freight car down a grade on the street railway company's premises, it appeared that, through no fault of the railroad, the car broke away from the engine and the deceased could not stop it by means of the hand brake. The plaintiff claimed the brake was defective, the shoe being worn and the chain knotted. The Minnesota Supreme Court held that, in the absence of evidence that these defects impaired the efficiency of the brake, the trial court properly directed a verdict for the defendant.—*Benedict v. Chicago, B. & Q.* (Minn.), 186 N. W. 296.

Labor Board Decisions

Switchman Not Always a Baggage-master

Station employees of the Boston & Maine claimed that the term "switchtender" as used in memorandum 16-27 of Railway Board of Adjustment No. 1, means an employee who is assigned to handle a main line or lead switch. The employees contend that certain of their members are devoting four or more hours time to work which is usually assigned to baggage-masters, while still under the pay and classification of a switchtender. The carrier states that while the employees in question do not handle switches for yard engines or freight trains, they do handle one or more main line switches in connection with a terminal where a yard engine is maintained, and therefore, come within the scope of the decision of the Railway Board of Adjustment No. 1 of the United States Railroad Administration. The position of the carrier was sustained.—*Decision No. 765.*

Watchman Not Entitled to

Overtime for Emergency Work

A crossing watchman on the Atchison, Topeka & Santa Fe was employed on a monthly basis for eight hours daily. For a period of six days he was required to work three hours extra each day on oral instructions received from the station agent and no additional compensation was paid. The employee's representative claimed that he should have been paid under section A-12 of the agreement which specifies that overtime shall be paid on the hourly basis for the ninth and tenth hours and time and one-half for hours in excess of ten. The decision of the board was that this clause was not intended to cover temporary assignments for emergency purposes and decided that the watchman was not entitled to extra compensation for his work. The decision stated further, however, that it is not intended to permit the assignment of employees for any considerable period without payment of overtime.—*Decision No. 808.*

Brakemen to Receive Baggage-men's Pay

If Any Baggage is Handled

The brakemen on two through passenger trains on the Missouri, Kansas & Texas were required in connection with their other duties to handle a limited amount of baggage carried in the head end of a combination car. These employees made claim for additional pay for this service, after which the duty was transferred to the train porter. The employees then contended that the baggage should be handled by the brakemen and paid for at the rate shown for baggage-men, which at that time was \$4 additional monthly. The carrier stated that the amount of baggage was not enough to justify the employment of a baggage-man and that the train porter could handle it without interfering with his other duties. However, the Labor Board decided that the work of handling baggage on these trains should be paid for at the rate shown for baggage-men and that the practice of having the work performed by trainmen was approved.—*Decision No. 772.*

Seniority Rights of Signal Maintainers

The Brotherhood of Railroad Signalmen of America brought before the Labor Board the case of a signal maintainer on the Chicago, Burlington & Quincy, who was "bumped" from his position by a supervisor whose position was abolished. It was contended that when the maintainer was hired no mention was made of the position being a temporary one and that because of the fact that the supervisor of signals was considered an official he did not come within the provisions of the signalmen's agreement. The Labor Board decided that the appointment of this man to the position of signal supervisor did not constitute a temporary appointment in this case and that his service with the carrier was not disturbed by such an appointment. It further decided that the man demoted is entitled to the position of signal maintainer by displacing the employee having the least seniority.

rights on the seniority district and that the man originally holding the position of maintainer before the supervisor was demoted was entitled to retain his position, provided his position was not that of junior signal maintainer.—*Decision No. 801.*

Right to Close Telegraph Office on Certain Days

In a controversy between the Order of Railroad Telegraphers and the Baltimore & Ohio it developed that in March, 1921, because of light traffic the telegraph office at Cheat Haven, Pa., was closed on a Sunday and a Monday and that at Mount Braddock on a Monday. The employees claimed that no provision was made in the agreement for notifying employees when they are not required to work on week days, which they claim indicated that the carrier did not contemplate suspending an employee on any other days than Sundays and holidays. The carrier contended that to agree to the claim of the employee would guarantee pay for 306 days each calendar year whether employees worked or not and would prohibit reductions in force to meet future fluctuations in business. The claim of the employees was denied.—*Decision No. 789.*

Elevator Men Not Rated As Stowers or Stevedores

Prior to Federal control, the men operating elevators in the freight house of the Michigan Central at Chicago, were rated with stevedores and certain other classes of employees who were paid a differential of one cent an hour over truckers. In the application of Supplement No. 7 to General Order No. 27, this differential was absorbed by the provision of that supplement which fixed a maximum rate of 43 cents per hour for all such classes of employees. The increase of 10 cents per hour provided for the elevator operators in section 5, Article II, of Decision No. 2, was added to the rate of 43 cents per hour, effective May 1, 1920. The employees state that while they are classed as elevator men, they perform other duties incident to the handling of freight which justifies a differential over truckers, and, inasmuch as they received the same differential as stevedores, etc., prior to federal control, they should receive the increase provided for such classes in paragraph (b) section 8 Article II of Decision No. 2. The carrier contends that these employees are classified as elevator men and that their duties consist of operating elevators between the various floors of the freight house and, that they do not perform the other duties mentioned. The contention of the carrier was sustained.—*Decision No. 788.*

Must Reinstate Employee Discharged

For Alleged Insubordination.

In a case where an assistant division accountant of the Chicago, Milwaukee & St. Paul was dismissed from the service of that road on February 24, 1921, for alleged insubordination caused by his refusing to work overtime in order to make up such work as accumulated during his vacation period, the Labor Board was requested to reinstate the man in question and pay him for the time since lost. The carrier contended that he was granted a vacation with pay from November 19, 1920, to December 3, under a rule which provided that employees would receive vacations with pay with the understanding that the other employees would keep up the work, or that the employees who received vacations with pay, would be required when they returned to make up the work accumulated on their desks without extra compensation. Upon returning from his vacation this assistant division accountant was informed that there was sufficient work to require the overtime performance of his duties, and he thereupon insisted for extra payment for any such overtime work which he might do. He showed an uninterested attitude toward the work and welfare of the service, with the result that certain reports were delayed. The employees state that he did not refuse to work overtime when ordered to do so, and that the reports had not been delayed any more than had been frequently the case in that office. Also, that if overtime was required it should have been ordered from proper authority and that the controversy for overtime payment should be likewise submitted for settlement in accordance with the provision of the clerks' national agreement. The Labor Board has decided that the discipline in the case was not well sustained and ordered the employee reinstated with seniority rights unimpaired, though it denied claim for pay during time since lost.—*Decision No. 734.*

Foreign Railway News

Further Reduction in British Wages

LONDON

A further reduction of 2 shillings a week (about 48 cents at the normal rate of exchange) in the sliding scale wages of the railway workers in Great Britain came in operation on April 1, 1922, owing to the fall in the cost of living index from 99 points in December to 86 points at the present time, both figures representing the increases over the 1914 level.

German Industry and Java

LONDON

It is reported that a German industrial syndicate, the Siemens-Rhine-Elbe-Schuckert Union Works, is erecting a factory in Cheribon, North Java, for the manufacture of rolling stock and steel and iron goods. The works are planned so as to make them independent of the parent company as regards the construction of locomotives, railway carriages, freight cars and wagons, railway bridges, and so forth. The local government has already placed orders for a large number of locomotives and general railway rolling stock.

1922 Budget of Swiss Railways

On January 24, according to Commerce Reports, the Swiss National Assembly passed the 1922 budget for the Swiss Federal Railways, which shows estimated receipts of 412,000,000 francs and estimated expenses of 335,000,000 francs. There is, therefore, a credit balance of 75,000,000 francs, against a smaller balance of 20,000,000 in 1921. The credit balance for 1922 does not cover fixed charges or amortization, which, if included, would turn the favorable balance into a 30,000,000 franc deficit. After approving the budget the National Assembly authorized the Federal Railway Council to raise a loan of 250,000,000 francs.

Turbo-Electric Locomotive Being Tried in England

LONDON

Trials are being made on the London & North Western Railway, England, of a turbo-electric locomotive constructed by Messrs. Armstrong Whitworth & Company, for the Ramsay Condensing Locomotive Company. The engine has a length over all of 69 ft. 7 in. and weighs 130¾ long tons, including coal and water. The boiler, which is in front, generates steam at 200-lb. pressure and 300 deg. F. superheat. The main three phase turbo-alternator and the auxiliary exciting turbo-generator are also in the front. The current is taken to four 275 h.p. electric motors, two of which drive the wheels of the front part and two those of the back part or tender. The exhaust steam is conducted to the tender, where it is condensed in a condenser of special construction. The condensed water returns to the hot well and thence to the boiler. The object sought is economy of coal and water.

American Ability to Compete for

Argentine Car Business

Commerce Reports gives some gratifying figures of American ability to compete against foreign bidders on railway equipment in Argentina in spite of adverse exchange rates. On bids for supplying 650 freight cars of 750 millimeter gage the bids were as follows: Belgian, 1,080,000 pesos; American, 1,160,000 pesos; British, 2,000,000 pesos; German, 2,480,000 pesos. The quotations include three years' interest. The American offer is based upon an exchange rate of 1.22 pesos per U. S. dollar, against a par of 1.04—or a disadvantage of 17 per cent. In spite of this fact, however, the American bid was but 7 per cent over the Belgian. Attention is called to the fact that Germany with exchange all in her favor quoted more than double the American price. All of which goes to show our strength in the market, which will become greater if the Argentine peso continues its move to parity with the dollar.

Failure of Soviet Railways Brings Starvation

The number of persons who will survive the famine conditions in stricken Russia is almost wholly dependent on the Russian railways now transporting grain for the American Relief Administration, Secretary Hoover has declared.

During the past thirty days 100,000 tons of seed wheat and foodstuffs have been delivered to seven different ports on the Baltic and Black seas, but only 25,000 tons has been transported over Russia's demoralized rail system.

American relief ships have delivered the seed and foodstuffs to Reval, Riga, Libau and Danzig, on the Baltic, and Novorossisk, Theodosia and Odessa on the Black Sea. From 120,000 to 140,000 additional tons of stuff, according to Mr. Hoover, will be delivered at these same ports during the next thirty days and the prospects are that shipments will continue to pile up at the ports, with very little chance of the Russian railroads being able to transport to the famine area much more than the amount shipped during the last thirty days.

The best shipment in one day into the famine area was 1,400 tons. Normally the Russian railroads to this region should be able to transport 20,000 tons, Mr. Hoover said, attributing the difficulty experienced in handling the grain in Russia to lack of fuel, dilapidated equipment and incompetent management of the railways.

Waterloo Station Completed

Waterloo station, the London passenger terminus of the London & South Western, has just been completed after 20 years spent in building. This station is, according to Modern Transport (London), the largest and probably the best designed in England.

It was in 1900 that authority was secured for undertaking the remodeling of the Waterloo terminal. It was soon discovered that an entire remodeling of the layout would be required. Accordingly, in addition to the rebuilding of existing facilities, 8½ acres of additional lands were taken over and improved.

The completed station has 21 stud-end platforms, varying in

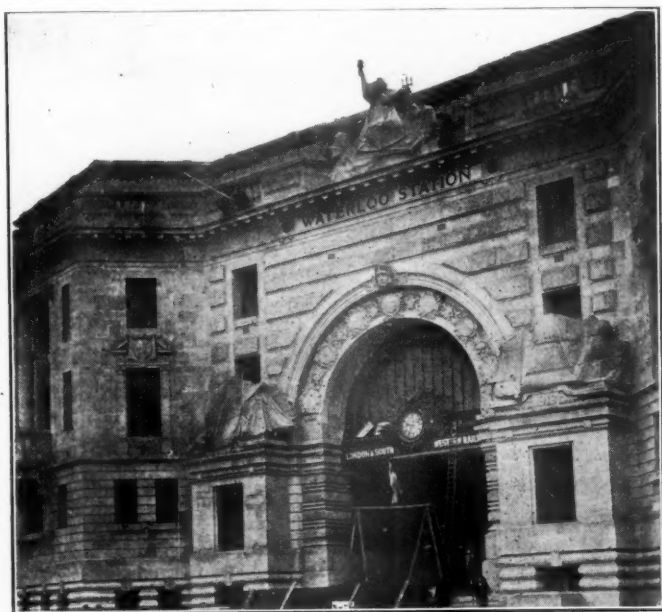


Photo by Kadel & Herbert

The New Memorial Arch, Waterloo Station

length from 531 feet to 860 feet, and all of them giving onto a concourse. In addition, passenger and baggage subways connecting 15 of the platforms are provided beneath the tracks and electric elevators are provided to connect the baggage subways with the platforms. There are ample facilities for the comfort and refreshment of employees and passengers.

One of the features of the station is the arch, erected in memory of the 585 members of the railway's staff who lost their lives in the war. This arch in process of completion is shown in the accompanying illustration.

Equipment and Supplies

Locomotives

THE NORFOLK SOUTHERN contemplates buying 5 locomotives.

THE LONG ISLAND has ordered 6 eight-wheel locomotives from the American Locomotive Company.

THE BOSTON & MAINE is inquiring for 2 Mallet 0-8-8-0 type and 20, 0-8-0 Switching locomotives.

THE ALABAMA GREAT SOUTHERN has ordered 10 Mikado locomotives from the American Locomotive Company.

THE WICHITA FALLS & SOUTHERN has ordered 2 Mogul type locomotives from the Baldwin Locomotive Works.

THE TENNESSEE, COAL, IRON & RAILROAD COMPANY has ordered 4 locomotives from the American Locomotive Company.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has ordered 10 Mikado type locomotives from the American Locomotive Company.

THE MOBILE & OHIO, which was reported in the *Railway Age* of April 1 as inquiring for 10 Mikado type locomotives, has ordered this equipment from the American Locomotive Company.

THE LOUISVILLE & NASHVILLE has ordered 4 Mikado type and 6, 0-8-0 switching locomotives from the American Locomotive Company, in addition to the 6 Mikados previously reported.

THE TENNESSEE CENTRAL, reported in the *Railway Age* of April 8 as inquiring for from 4 to 6 Mikado type locomotives, has ordered 8 Mikado type locomotives from the American Locomotive Company.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of March 25 as contemplating the purchase of 50 locomotives, has plans drawn for 50 locomotives and will have them built if prices are satisfactory.

THE NEW YORK CENTRAL, reported in the *Railway Age* of March 25 as inquiring for 50, 0-8-0 type switching locomotives, has ordered 40 locomotives from the Lima Locomotive Works and 35 from the American Locomotive Company.

Freight Cars

THE TENNESSEE CENTRAL is inquiring for 350 gondola cars.

THE WABASH is inquiring for 250 hopper car bodies of 50 tons capacity.

THE ATLANTIC SEABOARD DISPATCH is inquiring for 400 refrigerator cars.

THE CHESAPEAKE & OHIO will close bids on April 17 for 1,500 40-ton box cars and 200 40-ton stock cars.

THE SOUTHERN PACIFIC will close bids on April 17 for 2,000 single-sheath automobile cars.

THE KIMBERLY CLARK COMPANY, Neenah, Wis., is inquiring for a small number of coal cars.

THE MISSOURI, KANSAS & TEXAS will close bids on April 25 for 2,000 single-sheath automobile cars.

THE ST. LOUIS SOUTHWESTERN has awarded a contract to the American Car & Foundry Company for repairing 200 cars.

THE SOUTHERN PACIFIC will build 200 double-sheathed box cars of 40-tons capacity in its shops at Los Angeles, Cal.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered 200 sets of underframes and superstructures from the Pullman Company.

THE ELGIN, JOLIET & EASTERN has ordered 200 car bodies for 50-ton structural steel side dump cars and 300 car underframes from the J. W. Heggie Company, Joliet, Ill.

THE ATLANTIC COAST LINE, reported in the *Railway Age* of February 25 as inquiring for 100 steel phosphate cars, has ordered this equipment from the Chickasaw Shipbuilding Corporation.

THE MISSOURI, KANSAS & TEXAS, reported in the *Railway Age* of April 8 as contemplating the purchase of 2,000 automobile cars, is asking for bids on this equipment until 12 o'clock noon April 25. These cars are to be of 40 tons capacity.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY, St. Louis, Mo., has awarded a contract to the American Car & Foundry Co. for repairing 200 refrigerator cars at Memphis, Tenn., and also has awarded a contract to the Missouri Pacific for repairing 100 refrigerator cars.

THE LOUISVILLE & NASHVILLE, noted in the *Railway Age* of March 25 as inquiring for 500 all-steel hopper cars, of 55 tons capacity and for 500 to 1,000 composite gondola cars of 50-ton capacity, has ordered 1,000 hopper cars from the Chickasaw Shipbuilding Company and 1,000 all-steel gondola cars from the Cambria Steel Company.

THE CHICAGO & NORTH WESTERN has renewed its inquiry for 2,750 freight cars and will accept bids until noon, April 22, for 1,250 40-ton, single-sheathed steel underframe box cars; 500 40-ton steel under and upperframe stock cars; 500 50-ton steel underframe and wood floor flat cars; 250 40-ton steel underframe and wood upper structure refrigerator cars, with insulated bodies and basket rack ice bunkers, and 250 50-ton steel underframe and composite body gondola cars.

New York Central Orders 16,000 Cars

THE NEW YORK CENTRAL, reported in the *Railway Age* of April 1 as negotiating with the car builders for the purchase of about 16,000 freight cars, has placed orders for 16,000 cars as follows:

Cincinnati Northern.....	250	40-ton	Box	Am. Car & Fdy. Co.
	750	55-ton	Hopper	Pullman Company.
New York Central.....	1,000	55-ton	Hopper	Am. Car & Fdy. Co.
	1,000	50-ton	Box	Am. Car & Fdy. Co.
	1,000	50-ton	Box	Standard Steel Car Company.
	1,000	50-ton	H.S. Gond.	Pressed Steel Car Company.
Cleveland, Cincinnati, Chicago & St. Louis.....	1,000	55-ton	Hopper	Am. Car & Fdy. Co.
	2,000	50-ton	Box	Am. Car & Fdy. Co.
Pittsburgh, McKeesport & Youngioghenny	1,500	70-ton	Hopper	Pressed Steel Car Company.
	1,000	70-ton	L.S. Gond.	Standard Steel Car Company.
Pittsburgh & Lake Erie....	1,500	70-ton	Hopper	Standard Steel Car Company.
	1,000	70-ton	L.S. Gond.	Standard Steel Car Company.
Michigan Central.....	2,000	50-ton	Box	Standard Steel Car Company.
	500	50-ton	H.S. Gond.	Gen'l American Car Company.
	500	50-ton	H.S. Gond.	Buffalo Steel Car Company.

Passenger Cars

THE MISSOURI, KANSAS & TEXAS is inquiring for 30 passenger cars.

THE SOUTHERN PACIFIC is rebuilding 23 mail cars in its own shops.

THE CHESAPEAKE & OHIO will close bids on April 22 for 53 passenger train cars.

THE CANADIAN PACIFIC has ordered 50 express refrigerator cars from the Canadian Car & Foundry Co.

THE A. B. C. TRANSIT REFRIGERATOR COMPANY, Chicago, is inquiring for from 100 to 200 40-ton express refrigerator cars.

THE BALTIMORE & OHIO, reported in the *Railway Age* of January 28 as inquiring for 40 coaches, 2 dining cars, 3 combination baggage and mail cars and 5 mail cars, has ordered 50 cars from the Pullman Company.

Iron and Steel

THE NEW YORK CENTRAL has ordered 2,000 tons of rail from the Illinois Steel Company.

THE LONG ISLAND will receive bids until 12 o'clock noon, April 27, for 2,500 tons of rail.

THE UNION PACIFIC has ordered 760 tons of steel to be used for reconstruction of a bridge at Parker, Wash.

THE SOUTHERN PACIFIC will install an electrically operated turntable, 100 ft. in length and weighing 183,000 lb. at Siskiyou, Ore.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS will receive bids for its requirements of high speed tool steel for the period from April 1 to June 30.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered 140 tons of structural steel from the American Bridge Company, for track elevation work in Chicago.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 10,000 tons of rails, divided as follows: 6,000 tons from the U. S. Steel Corporation; 1,000 tons from the Inland Steel Company; and 3,000 tons from another company. The same company is soon expected to order 2,000 additional tons.

Track Specialties

THE TERMINAL RAILWAY ASSOCIATION of St. Louis is inquiring for 75 track frogs.

THE TEXAS & PACIFIC is inquiring for 50,000 tie plates to be used on 75 and 85-lb. rails.

THE NORTHERN PACIFIC, noted in the *Railway Age* of April 1 as inquiring for 5,000 tons of tie plates, has placed its order with the U. S. Steel Corporation.

Machinery and Tools

THE ATCHISON, TOPEKA & SANTA FE is inquiring for a 15-ton electric traveling crane.

THE WESTERN MARYLAND has placed orders for six machine tools including 2 lathes, 2 shapers, and one radial drill.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for four 20-in. lathes, an emery wheel stand and a boilermaker's flange clamp.

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS have ordered through Mitsui & Co., New York City, 4 locomotive cranes, from the Browning Company, Cleveland, Ohio.

Miscellaneous

THE NEW YORK, NEW HAVEN & HARTFORD will receive bids until 12 o'clock noon April 17, at New Haven, Conn., for its requirements until December 31, 1922, of malleable iron castings.

THE CHILEAN STATE RAILWAYS will open bids on May 10, at Santiago, Chile, for railway equipment, consisting of replacement materials for locomotives, coaches and tenders. The New York City representative, Carlos Schneider, 141 Broadway, is authorized to receive tenders for transmission by cable up to the day previous to the opening of tenders.

Signaling

THE CENTRAL OF NEW JERSEY has contracted with the General Railway Signal Company for the installation of an electric interlocking at Nesquehoning Junction, Pa., a 64-lever machine of the unit lever type. Complete approach and sectional route locking will be provided; also electric lighting of signals and alternating current track circuits. This apparatus will be installed by the signal company.

Supply Trade News

Howard Cook has been appointed vice-president of the **Columbia Nut & Bolt Co.**, Bridgeport, Conn.

E. T. Pelton, vice-president of the **Armstrong Steel Castings Company**, Huntington, Ind., resigned on April 1.

The George Oldham & Son Company, Baltimore, Md., has opened a Philadelphia, Pa., office at 527 Commercial Trust building.

William E. Dougherty has joined the sales force at the Philadelphia, Pa., office of the **Independent Pneumatic Tool Company**, Chicago.

The Whiting Corporation, Harvey, Ill., has removed its Chicago sales office from 1245 Marquette building to 945 Monadnock building.

The National Railway Appliance Company has removed its office from 50 East Forty-second street, to suite 3002, Grand Central Terminal, New York City.

Ralph Barstow, sales manager of the **Greenfield Tap & Die Corp.**, Greenfield, Mass., has resigned and **Edward Blake**, vice-president, has taken over his duties.

The International Filter Company, Chicago, has moved its general offices from the First National Bank building to its works at 333 West Twenty-fifth place.

The Hulson Grate Company, Keokuk, Iowa, has recently established a grate assembling plant at 209 Johnson street, Keokuk, Iowa, to which address it has also moved its general offices.

The Roberts-Pettijohn-Wood Corporation, accounting service, has moved its offices from 20 East Jackson boulevard, Chicago, to 30 Cedar street in that city, where it has recently purchased a building.

Prof. C. C. Williams, professor of civil engineering at the University of Kansas, has been appointed head of the civil engineering department of the University of Illinois, succeeding **I. O. Baker** retired.

George W. Schalchlin, sales engineer of the **Allen-Bradley Company**, manufacturers of electrical controller apparatus, Milwaukee, Wis., has been appointed district manager of this company's new office in St. Louis, effective April 10.

S. W. Linheimer, formerly vice-president of the **Walter A. Zelnicker Supply Company**, St. Louis, Mo., has resigned from that company and has opened offices under his own name, at 428 First National Bank building, Chicago, as a dealer in second hand railroad equipment.

W. A. Van Hook, cost engineer of the Bureau of Valuation of the Interstate Commerce Commission, and formerly assistant district engineer of the Central District of that body, has resigned to become chief engineer of the **Roberts-Pettijohn-Wood Corporation** of Chicago.

W. C. Ames has been appointed district sales manager of the **Sharon Pressed Steel Company**, New York, with office at 20 East Jackson boulevard, Chicago, and **Ralph E. Phillips** has been appointed district sales manager with headquarters at 66 Broadway, New York City.

O. A. Lawrie has been appointed district sales manager in the New England territory with headquarters at Boston, Mass., of the **Ohio Brass Company**, Mansfield, Ohio. For the past 16 years Mr. Lawrie has been with the **American Copper Products Company**, Bayway, N. J.

F. Lavis has recently returned to New York from Bolivia where he has been engaged as consulting engineer to the Bolivian government and the **Ulen Contracting Corporation**

in connection with the railway from Atocha and La Quiaca and other railway projects in that country.

H. H. Roberts, chief engineer of the **Franklin Railway Supply Company**, New York, has been elected vice-president in charge of engineering; **G. L. Winey**, secretary, has been elected executive vice-president and **G. W. Floyd Coffin**, vice-president of the company, has been elected vice-president in charge of production and service.

C. J. McGregor, assistant sales agent of the **American Steel & Wire Company**, with headquarters at Cleveland, Ohio, has been promoted to sales agent, with headquarters at Buffalo, N. Y., succeeding **E. A. Niven**, who has been transferred to New York City, and will be succeeded at Cleveland by **P. B. Gilroy**, who has been transferred from the Detroit office. Mr. McGregor has been in the service of this company for 20 years, first traveling in the New England territory for a period of 12 years, after which he was transferred to the Chicago, Ill., and Milwaukee, Wis., districts, where he remained for a year and eight months. He was made assistant sales agent at Cleveland in 1915, which position he was holding at the time of his recent promotion.

The Replogle Steel Company, Wharton, N. J., has acquired the property of the **Empire Steel & Iron Company**, Oxford, N. J. This addition to the Replogle Company has increased its pig iron production capacity 250,000 tons a year, bringing its total producing capacity to 600,000 tons and it has secured a controlling interest in the Mount Hope Mineral Railroad. It already owned the Wharton & Northern Railroad. The Replogle company is contemplating an early resumption of operation at its new furnaces at Wharton, N. J., and Catsauqua, Pa., where a large furnace has recently been modernized. **J. Leonard Replogle**, chairman of the board of Replogle Steel will remain in that capacity and **Leonard Peckett**, president of the **Empire Steel & Iron Company**, will be elected president of the Replogle Steel Company.

Obituary

Knox Taylor, since 1910 president of the **Taylor-Wharton Iron & Steel Company**, High Bridge, N. J., died at his home in High Bridge, on April 4. He was born at High Bridge on



Knox Taylor

October 19, 1873, and was graduated from Princeton University with the degree of bachelor of science in 1895. In January, 1902, he entered the service of the **Taylor Iron & Steel Co.** and worked up through various departments in the foundry and the old wheel shop until he became general manager in October, 1905. The High Bridge plant had been engaged in the production of manganese steel since 1892, under license of the Hadfield patents. In 1912 the company purchased all the interests of **William Wharton, Jr. & Co., Inc.**, of Philadelphia, and its subsidiary, the **Philadelphia Roll & Machine Co.** The Wharton Company had originated the application of manganese steel in track work in co-operation with the old **Taylor Iron & Steel Company**, and the new combination became known as the **Taylor-Wharton Iron & Steel Company**. In 1913 the company also bought out the interests of the **Tioga Iron & Steel Company**, Philadelphia. During the war, Mr. Taylor, in addition to the work of his company's own contracts for gun forgings, helped supply railway track material for the **American Expeditionary Forces**. Mr. Taylor was a vice-president of the **Railway Business Association** and a member of many clubs.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has authorized the construction of a brick combined freight and passenger station and the making of necessary track changes at Lyons, Kan. It has also begun the construction of a 7½-mile extension northeast from a point on its main line between Apperson and Burbank into the Hickman oil fields.

BALTIMORE & OHIO.—This company has awarded a contract to the Empire Engineering Company, Baltimore, Md., for the grading and masonry work on the ventilating plant on tunnel No. 1 at Ocean, W. Va. The contract for the motors and fans has been awarded to the B. F. Sturtevant Company, Washington, D. C. and the installation of the nozzle ducts and the housing of the equipment to the Virginia Bridge & Iron Works, Roanoke, Va.

CANADIAN PACIFIC.—This company has a location party in the field running surveys northwest from Tuffnell, Saskatchewan, to Wadena and north from Wadena to the North Saskatchewan river in contemplation of completing a line started 15 years ago.

CHICAGO & NORTH WESTERN.—This company will receive bids until April 20 for the construction of a 450-ton mechanical coal-ing station and ash handling facilities at Chicago avenue, Chicago, the construction of which will involve an expenditure of approximately \$100,000.

CHICAGO, BURLINGTON & QUINCY.—This company closed bids on April 13 for the construction of a 20 ft. by 60 ft. frame station at Pattensburg, Mo.

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract to the Thompson Black Company, Chicago, for the superstructure of its new inbound freight terminal at Chicago, this terminal to consist of a five-story building to form a part of the Chicago Union Station development.

CHICAGO UNION STATION.—This company has awarded to the Mellon-Stuart Company, Chicago, a contract for track slabs for the new station project and will close bids next week for foundations for a boiler plant and for a retaining wall along Canal street; and also for the construction of a concrete tunnel to be used in conjunction with the boiler house.

ILLINOIS CENTRAL.—This company which was noted in the *Railway Age* of March 4 as accepting bids for work incident to the construction of a third track from Matteson to Kankakee, Ill., a distance of approximately 25 miles and which was noted in the March 18 issue as awarding a contract to M. L. Windham, Centralia, Ill., for work between Kankakee and Tucker, has awarded a contract to the Walsh Construction Company, Davenport, Ill., for the work from Peotone to Matteson. The Bates & Rogers Company, Chicago, will do all masonry work in the vicinity of Matteson, including the extension of box culverts, the erection of overhead bridges over the Elgin, Joliet & Eastern and the construction of subways incident to grade separation work.

MISSOURI PACIFIC.—This company closed bids on April 14 for the construction of a pumping plant, reservoir and treating plant at Hoisington, Kan., the work to involve an expenditure of approximately \$250,000.

NORFOLK & WESTERN.—This company has awarded a contract to H. M. Waugh, Bluefield, W. Va., for the construction of a line 1.5 miles in length from Lamberts Point to Atlantic City, Va. The work involves the laying of 7,900 ft. of main line track and 1,800 ft. of spur tracks and sidings.

SOUTHERN PACIFIC.—This company has made definite plans for the rebuilding of timber preservation plants at Wilmington and Oakland, Cal., the plant at Wilmington to have 4 retorts, each 6 ft. in diameter and from 117 to 132 ft. long with two operating tanks of a total capacity of 62,000 gal., storage tanks of 31,000 gal. capacity and an annual treating capacity of 673,000 ties. The plant at Oakland will have 3 retorts, each 18 ft. in diameter and 132 ft. long, with adzing and tie boring machines, 3 operating

tanks having a total capacity of 195,000 gal., storage yards for 350,000 ties served by a 20-ton locomotive crane and an annual treating capacity of 7,500,000 board ft. of timber and 384,000 ties by the Reuping process as well as capacity for 625,000 ft. of piling by the dipping process. John D. Isaacs, consulting engineer, Southern Pacific, New York, is handling this work.

ST. LOUIS-SAN FRANCISCO.—This company has awarded a contract for a new hospital building to be erected at Springfield, Mo., at a cost of approximately \$800,000 to the William McDonald Construction Co., St. Louis.

NEW YORK CENTRAL.—This company has awarded a contract to the McClintic-Marshall Company, Pittsburgh, Pa., for the 23,000 tons of steel work for the Castleton bridge over the Hudson river.

PHILADELPHIA & READING.—This company has awarded a contract for the filling in of the Ringtown, Pa., viaduct. About 1,000,000 yards of dirt will have to be handled. A contract has been awarded to Bennett & Randall, Lebanon, Pa., for rebuilding a stone arch bridge north of Reading, Pa. This road is also contemplating the installation shortly of an interlocking plant and automatic block signals in connection with the completion of the Harrisburg bridge.

TUCKASEEGEE & SOUTHEASTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Sylva to Blackwood, Jackson County, N. C., and also for authority to issue \$300,000 of capital stock.

Pennsylvania to Spend \$8,000,000 at Pittsburgh

The Pennsylvania Railroad has authorized the expenditure of \$8,000,000 for improvements in the vicinity of Pittsburgh, Pa., as announced in last week's issue of the *Railway Age*. The expenditure forms a part of a general program of improvement work on the Central region which the company expects to carry out, step by step, in succeeding years. Little other work except as noted below has been authorized as yet. The various projects included in the Pittsburgh authorization are as follows:

At Pitcairn, 12 additional stalls of the reinforced pre-cast concrete type with drop pits and other facilities will be added to the existing facilities, making a full 34-stall house. The old 100-ft. turntable will be removed and the stalls connected up to a 110 ft. turntable now in place. The estimated cost of this work is about \$380,000.

At the Sharpsburg yard, additional running and yard tracks will be constructed and present tracks and layout consolidated to form one unit of a final yard development at that location. A part of this work will include two main freight running tracks from Etna to Aspinwall. The estimated cost is \$776,000.

The line from the west end of the Sharpsburg yard (Etna) will be extended to Thirtieth street, a distance of about three miles, at a cost of about \$713,000. This forms an extension of the four track system and will require the construction of two additional main tracks and the rearrangement of the existing tracks.

The construction of the Kenwood to Rochester low grade line on which work was suspended in 1921 will be resumed and about \$1,623,000 expended. This line will be two tracks from Kenwood Junction, Pa., along the Beaver river to West Rochester, Pa., and will have a maximum grade of 0.3 per cent compensated.

Two other items of improvement work, regarding which the exact location and details have not been announced as yet, include about one and one-half miles of heavy grade elevation and crossing elimination work to cost about \$2,365,000; and the enlargement and improvement of a yard and the construction of additional connecting tracks at a cost of nearly \$2,000,000.

Bids have been closed on other work not included in the \$8,000,000 authorization mentioned above as follows: A through truss overhead, highway bridge with a span of 108 ft. 6 in.; flanked by concrete viaduct approaches, at an estimated cost of about \$62,000; and a half-through girder bridge, 84-ft. 2-in. span with concrete viaduct approaches, at an estimated cost of about \$77,000. In addition there are six more highway bridges to be constructed, the details of which are not as yet available.

Railway Financial News

BALTIMORE & OHIO.—Authorized to Abandon Branch Lines.—The Interstate Commerce Commission has issued certificates authorizing the abandonment of 2.76 miles of the Magnolia branch, and the Pigeon Run branch, 7.31 miles, in Ohio.

BOSTON & MAINE.—Annual Report.—See article on another page of this issue entitled "Boston & Maine Has 1921 Deficit of \$7,348,086."

Opposes New Haven Directors.—There was no election of directors at the annual meeting on April 12 owing to the controversy which has arisen among certain groups of stockholders over the attempt of the New York, New Haven & Hartford to place a representation on the directorate. A hearing had been scheduled for April 8 in the District Court of the Southern District of New York on the New York, New Haven & Hartford's petition for a modification in the decree of 1914, so as to enable the New Haven to secure a representation on the Boston & Maine directorate proportionate to the Holding Company's voting rights, but this hearing was postponed until May 12.

Owing to this move by the New Haven there developed a sharp contest for proxies to be used at the annual meeting. One group of stockholders asking for proxies to run to Charles F. Adams, Philip Dexter and E. Sohler Welch, sent the following communication to holders of Boston & Maine first preferred and preferred shares:

There is no apparent reason which might now lead the preferred shareholders of the Boston & Maine to think that the nominees which the New Haven seeks to place on their board could devise means which would produce either the credit or the earnings which the Boston & Maine needs before the preferred dividends can be resumed. On the contrary, the preferred shareholders are bound to feel that this action of the New Haven is intended in its own interest.

The voting strength of the first preferred and preferred shares is nearly double that of the New Haven shares held by the trustees. These preferred shares, however, are widely distributed and have had no opportunity for concerted action since the reorganization. There was perhaps no occasion for such action so long as the New Haven remained content that its concentrated holdings should be voted in the sound discretion of trustees charged by the terms of the decree with a public interest, and in whom other shareholders of all classes felt a justified confidence.

The attempt of the New Haven, whether it be successful or not, shows that the preferred shareholders can no longer rest safely in this position, and that the time has come for them to look to their own interests.

Another group to bid for proxies was the Boston & Maine Stockholders' Protective Association. President Edward F. Brown of that organization strongly attacked the motive of the other group and asked for proxies for Edmund D. Codman.

BUFFALO, ROCHESTER & PITTSBURGH.—(Authorized to Draw Down Bonds.)—This company has been authorized by the Interstate Commerce Commission to procure the authentication and delivery of \$4,269,000 of consolidated mortgage bonds. The company had applied for authority to issue 8,351,000 of bonds, but inasmuch as it did not desire to dispose of them at the present time the authority was limited to the bonds which the applicant is entitled to draw down at this time under its consolidated mortgage.

CHICAGO, ROCK ISLAND & PACIFIC.—Annual Report.—The corporate income account for the year ended December 31, 1921, as shown by the annual report issued this week, follows:

	1921	1920
Operating revenues:		
Freight	\$99,000,440	\$94,973,798
Passenger	30,579,092	35,336,749
Total railway operating revenues.....	139,272,024	142,026,152
Operating expenses:		
Maintenance of way and structures.....	20,790,435	26,238,501
Maintenance of equipment.....	28,582,510	34,646,808
Traffic	2,238,114	1,841,026
Transportation	57,637,630	64,997,585
General	3,095,134	3,452,893
Total railway operating expenses.....	112,953,057	131,498,704
Net revenue from railway operations.....	26,318,967	10,527,448
Railway tax accruals.....	5,663,722	5,660,560
Railway operating income.....	20,654,009	4,856,556
Total other income.....	2,417,822	1,781,269
Total income	23,051,831	6,637,825
Interest on funded and unfunded debt.....	10,876,198	10,952,618
Total deductions	17,271,572	14,769,719
Net income.....	5,780,259	def. 8,131,894
Estimated government guaranty.....		13,028,100
Additional needed to earn standard return.....		233,051
Balance of income.....	5,780,259	4,663,155

Dividends:		
7 per cent preferred.....	2,059,547	2,059,547
6 per cent preferred.....	1,508,148	1,507,938
Total dividends	3,567,695	3,567,485
Balance surplus (carried to profit and loss)	2,212,564	1,095,670

FORT WORTH & DENVER CITY.—Asks Authority to Issue Equipment Trusts.—This company has applied to the Interstate Commerce Commission for authority for the issuance of \$750,000 of equipment trust certificates.

ILLINOIS CENTRAL.—Authorized to Execute Equipment Agreement.—The Interstate Commerce Commission has authorized the execution of an agreement for the lease and purchase of 650 refrigerator cars from the Pullman Company at an estimated cost of \$1,748,500.

MISSOURI & NORTH ARKANSAS RAILWAY.—New Company.—This company has been granted a 50-year charter by the State Board of Railway Incorporation of Arkansas. The new company was organized to take over the lines of the defunct Missouri & North Arkansas Railroad, operating from Joplin, Mo., to Helena, Ark., a distance of 368 miles. The road will be sold at a receiver's sale to be held in St. Louis, Mo., on April 10, and it has been stated that it will again be in operation by May 1. The new company has been capitalized at \$3,000,000, divided into 30,000 shares of \$100 each. In addition to the capital stock, the Interstate Commerce Commission authorized a federal loan of \$3,500,000 to any new corporation formed to take over the road, provided it is capitalized at not less than \$3,000,000. The former company's indebtedness, \$2,062,750, will be assumed by the new owners.

Asks Authority to Issue Securities.—Application has been made to the Interstate Commerce Commission for authority to issue securities for the purpose of taking over the property of that company in accordance with conditions proposed by the Commission in connection with a loan of \$3,500,000 from the government. It is proposed to issue \$3,000,000 of common stock to the holders of the receiver's certificates to the amount of about \$2,000,000 who propose to secure the payment of \$50,000 additional working capital and \$60,000 to provide competent supervision and operation of the property, and a 6 per cent first mortgage bond for \$5,000,000 to be given as security for the government loan.

MISSOURI & NORTH ARKANSAS.—Application for Loan Approved.—The Interstate Commerce Commission has certified its approval of a loan of \$3,500,000 to this company to meet maturing indebtedness, conditioned on the carrying out of a plan of reorganization in accordance with suggestions made by the commission. Application for authority to issue securities on this plan was filed recently.

NEW YORK CENTRAL.—Bond Sale.—A syndicate headed by J. P. Morgan & Co. has sold \$60,000,000 90-year 5 per cent refunding and improvement mortgage bonds at 94¾. The proceeds are to be used to liquidate 6 per cent notes and other indebtedness to the director general of railroads, to reimburse the treasury for expenditures, and to pay and refund bonds of affiliated companies. The issue has been authorized by the Interstate Commerce Commission.

NEW YORK, NEW HAVEN & HARTFORD.—Annual Report.—The annual report issued this week shows a corporate income account for the year ending December 31, 1921 as follows:

	1921	1920
Railway operating revenues:		
Freight	\$53,593,929	\$55,348,919
Passenger	50,934,294	52,270,794
Total railway operating revenues.....	116,405,233	123,512,310
Railway operating expenses:		
Maintenance of way and structures.....	17,355,931	20,654,480
Maintenance of equipment.....	27,424,576	30,438,181
Traffic	728,599	756,798
Transportation—rail line	54,728,204	67,723,026
General	4,061,645	4,402,602
Total railway operating expenses.....	106,402,295	126,346,384
Net revenue from railway operations.....	10,002,938	def. 2,834,073
Railway tax accruals.....	4,443,275	4,500,175
Railway operating income.....	5,513,941	def. 7,349,935
Total non-operating income.....	7,465,815	7,926,145
Gross income	12,979,756	576,210
Interest on funded debt.....	13,883,311	10,341,382
Total deductions from gross income.....	28,306,391	27,996,235
Net income, excluding government guaran-		
tees (see note).....	def. 15,326,635	def. 27,420,025
Government guarantees (see note), credit..	1,205,012	22,798,519
Net corporate income.....	def. 14,121,623	def. 4,621,506

Note—Government guarantees in 1920 included United States Railroad Administration operations and standard return for January and February, 1920, and guarantees under Transportation Act six months ending August 31, 1920. The figures shown against this item in 1921 cover lap-over items audited during the year but applying to the federal control or guaranty periods.

Asks Authority to Abandon Line.—The New York, New Haven & Hartford has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of 1.52 miles of track and of other railroad facilities at Saybrook Point, Conn.

Asks for Representation on B. & M. Board.—See Boston & Maine.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—The annual report issued this week shows the following income account for the year 1921:

	1921	1920
Operating revenues	\$14,127,867	.....
Operating expenses	12,067,086	.....
Net from railway operations.....	2,060,781	.....
Tax accruals	449,215	.....
Operating income	1,603,349	.....
Non-operating income	761,813	.....
Gross income	2,365,163	2,378,815
Deductions from gross income.....	1,728,703	1,523,477
Net income	636,550	855,339
Less expenses prior to January 1, 1918, settled through federal accounts.....	.....	49,449
Balance carried to profit and loss account.....	636,550	805,890

For the purpose of comparison, the following details of revenues and expenses show for 1920 the combined figures of the corporation, March 1 to December 31, inclusive, and those of the United States Railroad Administration for January and February:

OPERATING REVENUES		
	1921	1920
Merchandise freight	\$3,220,694	\$3,115,005
Coal freight	5,498,964	4,885,788
Milk	1,307,616	1,167,585
Passenger	3,421,743	3,098,508
Total, including other.....	\$14,127,867	\$13,154,689
OPERATING EXPENSES		
Maintenance of way and structures.....	\$2,291,227	\$2,249,094
Maintenance of Equipment.....	3,194,650	3,449,277
Traffic	179,236	145,718
Transportation	6,025,267	6,484,478
General	376,706	355,750
Total operating expenses.....	\$12,067,086	\$12,684,317
Net revenue from railway operation	2,060,781	470,372
Railway tax accruals.....	449,215	457,040
Total railway operating income.....	\$1,603,349	\$10,714
PASSENGER TRAFFIC		
Number of revenue passengers carried.....	1,645,586	1,925,897
Number of passengers carried one mile.....	95,065,432	98,911,515
Average distance carried.....	57.77	51.36
Average receipts per passenger per mile.....	\$0.0360	\$0.0313
MILK TRAFFIC		
Number of tons carried of milk earning revenue....	148,623	152,835
Number of tons carried one mile.....	28,607,128	27,131,032
Average distance haul of one ton.....	192.48	177.52
Average receipts per ton per mile.....	\$0.0457	\$0.0430
FREIGHT TRAFFIC		
Number of revenue tons carried.....	4,944,135	5,279,972
Number of tons carried one mile.....	669,994,265	691,073,698
Average distance haul of one ton.....	135.51	130.89
Average receipts per ton per mile.....	\$0.0130	\$0.0116

NORTHERN PACIFIC.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue so many of its 5 per cent refunding and improvement mortgage bonds maturing July 1, 2047, as may be necessary to pay off joint Great Northern-Northern Pacific 6½ per cent bonds which may be turned in for payment in cash after being called for redemption under the provisions of the joint indenture securing them. Of the issue of \$230,000,000 of joint 6½ per cent bonds, \$115,000,000 have already been converted into Great Northern bonds and about \$11,000,000 have been converted into Northern Pacific 6 per cent refunding and improvement mortgage bonds, leaving the Northern Pacific liable for \$104,000,000 of the joint bonds outstanding. It appears to the Northern Pacific that it can bring about a large reduction in its future interest payments by calling for redemption as soon as possible all outstanding 6½ per cent joint bonds at 103½. Holders of the bonds have the right to convert into 6 per cent bonds, which would reduce the interest by ½ per cent, but the company believes that the holders of a large amount of the joint bonds will take cash instead of converting them. It has received from J. P. Morgan & Co., and the First National Bank a proposal to purchase 5 per cent bonds at 90 and interest to whatever amount may be required to furnish the cash to retire the joint bonds, providing authority for the entire transaction is obtained from the commission.

Directors Resign.—E. M. Willis, assistant secretary and assistant treasurer of the Northern Pacific, and E. A. Gay, secretary of the company, have been elected directors to succeed James

N. Hill and Thomas W. Lamont, resigned. Mr. Lamont, of J. P. Morgan & Co., has resigned as a director because his firm will float the issue of new proposed 5½ per cent bonds, which the company will offer in exchange for the joint 6½ per cent bonds, issued jointly with the Great Northern last summer.

Restoration of 7 Per Cent Dividends.—Howard Elliott, chairman of the board, in reply to a stockholder who asked when the restoration of dividends at the former annual rate of 7 per cent might be looked for, said:

In 1921, because of the large extra dividend, the Northern Pacific received from the Burlington \$13,000,000 more than it will receive from that company this year. This extra dividend enables the Northern Pacific, as is shown by the annual report, to meet its interest charges and to pay the full 7 per cent on the stock.

At the recent meeting of directors, at which the dividend was reduced, it was decided that it would not be conservative, in view of the prevailing conditions and uncertainties, to pay the full rate. I cannot say when it will be restored, but at that time the board hoped that business would resume next Autumn to such an extent as to justify that action.

The returns on the Northern Pacific for the first three months of this year were discouraging. Business is better, but there are still many elements of uncertainty. The pay of our employees has been cut to the bone, and no further reduction can be made unless the Railroad Labor Board gives relief as to the units of wages.

OREGON TRUNK.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line between South Junction and Metolins, Ore., 28.9 miles, because it is paralleled by the Central Oregon branch of the Oregon-Washington Railroad & Navigation Company and the two companies have entered into an agreement for the joint use of the latter's track.

ULSTER & DELAWARE.—*Guaranty Certified.*—The Interstate Commerce Commission has issued a final certificate stating the amount of this company's guaranty for the six months following federal control at \$314,250, of which the balance due was \$69,450.

UNION PACIFIC.—*New Directors.*—Newcomb Carlton and Paul M. Warburg have been elected directors to succeed Otto H. Kahn and Mortimer L. Schiff, who resigned December 1 in accordance with the Interstate Commerce Commission's ruling against interlocking directorates.

VIRGINIAN.—*Authorized to Issue Bonds.*—This company has been authorized to issue \$1,590,000 5 per cent, first mortgage, 50-year gold bonds to be pledged as part collateral security for a 6 per cent promissory note of \$2,000,000 to be issued to the director general of railroads.

WEST JERSEY & SEASHORE.—*Annual Report.*—The annual report issued Wednesday shows an income account for December 31, 1921, as follows:

	1921	*1920
Total operating revenues.....	\$12,929,706	\$12,476,036
Total operating expenses.....	11,683,649	11,995,283
Net revenue from railway operations.....	1,246,058	480,753
Railway tax accruals.....	711,611	473,848
Railway operating income.....	533,779	6,654
Net railway operating income.....	286,636	Def. 301,282
Total non-operating income.....	318,439	281,960
Gross income	605,075	140,102
Total deductions from gross income.....	414,547	503,801
Net income	190,528	Def. 363,699
Appropriations to sinking fund.....	103,045	99,445
Balance transferred to credit of profit and loss.....	87,483	463,144

*Operating results March 1 to December 31, 1920.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several roads the following amounts:

Lehigh & New England.....	\$675,000
Ogden Union Railway & Depot Company.....	15,000

The payment of these claims on final settlement is largely made up of balance of compensation due, but includes all other disputed items as between the railroad companies and the administration during the 26 months of federal control.

Trend of Railway Stock and Bonds Prices

	April 11	Last Week	Last Year
Average price of 20 representative railway stocks, close of business.....	64.27	62.03	53.42
Average price of 20 representative railway bonds, close of business.....	84.54	83.83	73.78

Railway Officers

Financial, Legal and Accounting

C. L. Snyder has been appointed assistant auditor of disbursements of the Philadelphia & Reading, succeeding **W. K. Bean**, assigned to other duties.

Operating

S. A. Johnson, general superintendent of the St. Paul Bridge & Terminal, having resigned, the position has been abolished.

H. D. Green, division superintendent of the Cleveland division of the Baltimore & Ohio until its consolidation with the New Castle division as announced in the *Railway Age* of April 1 has been appointed general agent with headquarters at Cleveland, Ohio.

T. R. Baird has been promoted to district supervisor of transportation of the Southern district of the Southern Pacific at Los Angeles, succeeding **L. P. Hopkins** who has been promoted to trainmaster of the Salt Lake division in place of **W. H. McBean**. Mr. McBean has been promoted to assistant superintendent of the Tucson division at Tucson, Ariz., succeeding **A. E. Brown**, deceased.

Mechanical

J. P. Puette has been appointed supervisor of electric appliances, New York Central, lines west of Buffalo, with headquarters at Cleveland, Ohio. Mr. Puette was born near



J. P. Puette

Lenoir, N. C., and was educated in public and private schools of that section. He entered the service of the Ashville Street Railway Company, Ashville, N. C., in 1896. He remained with this company for a period of two years, 1896-1897. The next two years were spent with the Whiting Lumber Company, Elizabethtown, Tenn., and the following year and a half, 1900-1902, with the Pittsburgh Railway Company, Pittsburgh, Pa. The following year he was in the employ of the Variety Iron & Steel Company, Cleveland, Ohio. In the fall of 1903, Mr. Puette entered the service of the Lake Shore & Michigan Southern as an electrician at Collinwood, Ohio, and held this position until January, 1908, at which time he was transferred to Chicago as foreman electrician of car lighting, holding this position until May, 1910, when he was transferred to Collinwood, Ohio, as general foreman electrician of car lighting. In February, 1913, he was transferred to the General Office Building, Cleveland, Ohio, as assistant to the supervisor of electrical appliances in this position until the time of his recent promotion.

Traffic

T. L. Darneal has been appointed district freight and passenger agent of the Missouri, Kansas & Texas with headquarters at Denver, Colo.

W. E. Bock has been appointed district freight and passenger agent of the Missouri, Kansas & Texas with headquarters at Seattle, Wash.

B. M. Croll has been appointed general agent, freight department, of the Philadelphia & Reading with headquarters at New York City. **I. L. Fish** has been appointed assistant general agent with the same headquarters.

Roy Pearce, special representative of the Passenger Department of the Chicago & Alton with headquarters at Chicago, has been promoted to general agent, passenger department, with the same headquarters, to succeed **Harry K. McEvoy**, resigned to engage in other business.

William Pugh, whose appointment as assistant general freight agent of the Buffalo, Rochester & Pittsburgh was announced in the *Railway Age* of April 8, page 900, was



Wm. Pugh

born in England on August 22, 1871. He was educated at a boarding school in England, at the High-bury School, London, and at the night sessions of Central High School, Rochester, N. Y. In May, 1889, he entered the service of the Buffalo, Rochester & Pittsburgh as a messenger in the accounting department. Later he became a clerk in the ticket auditing department and was later transferred to the freight auditing department. He served in the claim department for more than a year

and was then appointed assistant paymaster, which position he occupied for two years, when he was assigned to the position of rate revision clerk. He held this position for six years and was then appointed chief clerk in the freight auditing department. Seven years later he became a rate clerk in the freight department and, two years later, was promoted to chief clerk in the department, which position he held at the time of his promotion as above noted.

J. R. Holcomb has been promoted to Pacific Coast agent of the Toledo, St. Louis & Western with headquarters at Los Angeles, Cal., where he will assume the duties of **W. H. Andrew**, general agent who has resigned, the office of general agent at San Francisco having been abolished.

Fred Wight, city passenger agent of the Chicago, Great Western at St. Paul, Minn., has been promoted to general agent, passenger department, with headquarters at Des Moines, Iowa, to succeed **W. L. Feeley**, who has been transferred to Minneapolis, Minn., succeeding **J. D. Elmer**, resigned.

A. W. Noyes, general traveling passenger agent of the Chicago Great Western, with headquarters at Chicago, has been promoted to assistant general passenger agent with the same headquarters. **Fred White**, division freight and passenger agent at St. Paul, Minn., has been appointed city passenger agent at St. Paul to succeed **Warren L. Seeley**, who has been promoted to general agent, passenger department, at Des Moines, Iowa, in place of **C. D. Fisher**, assistant general passenger agent at Des Moines, who has been appointed general agent, passenger department, at Minneapolis, Minn., to succeed **J. D. Elmer**, resigned to engage in other business, the offices of assistant general passenger agent at Des Moines and Minneapolis having been abandoned.

Eugene B. Finegan, who has been promoted to general freight agent of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, to relieve **T. W. Proctor**, also general freight agent, of duties incident to management of the general office and of handling tariffs, rates divisions, etc., in all territory east of Mobridge, S. D., was born at Iron Ridge, Wis., November 16, 1880. He entered railway service in December, 1899, as an assistant in the car shops of the Chicago, St. Paul, Minneapolis & Omaha at Hudson, Wis., where he remained until February, 1903, when he became a stenographer

and clerk in the office of the general agent of the Great Northern at St. Paul. In May, 1904, he was employed in a similar capacity in the office of the commercial agent of the Chicago, Milwaukee & St. Paul at St. Paul and continued in this work until November, 1906, when he was transferred to Chicago as chief clerk to the assistant general freight agent of the same road. Thereafter he was successively chief clerk to the general freight agent, chief clerk to the freight traffic manager and chief clerk to the vice-president until April, 1916, when he was promoted to chief of the tariff bureau. In February, 1917, he was promoted to assistant general freight agent, with the same headquarters, and continued in this capacity until his recent promotion to general freight agent.

Engineering, Maintenance of Way and Signaling

G. W. Rear, general bridge inspector of the Southern Pacific, with headquarters at San Francisco, Cal., who was recently given the newly created title of engineer of bridges, as announced in the *Railway Age* of April 1, was born in Ontario on June 13, 1873, and attended the Campbellford Collegiate Institute from 1886 to 1889, when he entered the engineering department of the Midland Railway of Canada as a student. He held various positions in this department on the Midland until its acquisition by the Grand Trunk in 1894 and continued in similar positions with the latter company until 1901, when he became connected with the Southern Pacific. His first work on this road was in steel bridge erection, in which service he was employed until April 1, 1902, when he became assistant general bridge inspector. He served in this capacity until August 15, 1905, when he was promoted to general bridge inspector, with duties similar to those of engineer of bridges, his new position.



Geo. Rear

Elmer Irving, division engineer of the Pennsylvania Railroad with headquarters at Harrisburg, Pa., has been promoted to engineer maintenance of way with headquarters at Williamsport, Pa., succeeding C. H. Niemeyer, deceased. Mr. Irving was born at Trenton, N. J., on January 4, 1878, and entered the services of the Pennsylvania as a rodman in the office of the assistant engineer in New York on June 15, 1895. Later he enrolled in Cooper Institute and was graduated from that institution in 1900. On July 20, 1901, he was promoted to draftsman on the New York division and on April 25, 1902, he was advanced to the position of transitman under the principal assistant engineer at Altoona, Pa. On January 1, 1903, he was promoted to assistant supervisor of the West Jersey & Seashore with headquarters at Haddonfield, N. J., being subsequently transferred in that capacity to New Florence, Pa., on January 15, 1904. On August 1, 1905, he was promoted



Elmer Irving

to supervisor of track with headquarters at Osceola Mills, Pa., being transferred to Earnest, Pa., on December 1, 1908, and to Lancaster, Pa., in 1912. On September 28, 1916, Mr. Irving was promoted to division engineer on the Trenton division with headquarters at Camden, N. J., serving at this point until May 26, 1918, when he was transferred to the Philadelphia division with headquarters at Harrisburg, Pa., where he was located at the time of his recent promotion.

W. R. Triem has been appointed assistant division engineer of the Logansport division of the Pennsylvania.

Purchasing and Stores

H. H. Disher has been appointed purchasing agent of the Toronto, Hamilton & Buffalo Railway and of the Toronto, Hamilton & Buffalo Navigation Company, succeeding G. W. Holmes, resigned on account of ill health.

Obituary

J. H. Campbell, treasurer of the Interborough Rapid Transit Company, New York, died at Garden City, Long Island, on April 5.

John D. Smith, retired superintendent of telegraph of the Canadian Pacific, died in Chicago on April 7 from heart failure.

John W. Midgley, whose death in Chicago on April 4 was announced in the *Railway Age* of April 8, was born in Leeds, England, on September 24, 1843, and entered railway service in 1868 as a stenographic secretary to the general superintendent of the Illinois Central at Chicago. After serving in this capacity for three years he became stenographic secretary to the president and from 1872 to 1876 was employed in similar positions in the office of the president, general manager and general solicitor of the Chicago & North Western. In 1876 he became the secretary of the South Western Railroad Rate Association, in which association he was made a commissioner in 1878. He remained a commissioner of this association from 1878 to 1887 and from January, 1881, to April, 1887, was also a commissioner of the Colorado Traffic Association, from October, 1882, to December, 1883, a commissioner of the Iowa Trunk Line Association and from October, 1884, to January, 1887, a commissioner of the Pacific Coast Association. On April 1, 1887, he became chairman of the Associated Southwestern Colorado, Utah and Pacific Coast Lines and was chairman of the Western Freight Association until its dissolution in 1898. In April, 1891, he organized the Bureau of Car Performances and began the agitation which led to the substitution of per diem mileage for rental of freight cars. During 1903 and 1904 he carried on an investigation of private car uses which resulted in the federal investigation of this activity and in 1905 promoted the sentiment which led to information of the American Railway Clearing House Bureau. Mr. Midgley retired from active service in 1908 because of blindness and took up his residence in Evanston, Ill., where he was living at the time of his death.



John Midgley

THE SPOKANE TRANSPORTATION CLUB, Spokane, Wash., has moved to larger quarters in the Title building, Sprague and Wall streets, in that city. The officers of the club, recently elected, are as follows: President, A. S. Cobb; vice-presidents, R. E. Carson, G. B. Paul; chairman house committee, W. N. Joyner; and secretary-treasurer, F. J. Greene.